STATE OF RHODE ISLAND

COASTAL NONPOINT POLLUTION

CONTROL PROGRAM

ENVIRONMENTAL ASSESSMENT

AUGUST 1996

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service

STATE OF RHODE ISLAND

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Office of Ocean and Coastal Resource Management
Coastal Programs Division
1305 East-West Highway
Silver Spring, MD 20910

August 1996

U.S. DEPARTMENT OF COMMERCE
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National Oceanic and Atmospheric Administration
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DESIGNATION: Environmental Assessment

TITLE: State of Rhode Island Coastal Nonpoint Pollution Control Program

ABSTRACT: This environmental assessment is prepared pursuant to the National Environmental Policy Act (NEPA), 42 U.S.C. 4321 et seq. to assess the environmental impacts associated with the approval and implementation of the Coastal Nonpoint Pollution Control Program (coastal nonpoint program) submitted to NOAA and EPA by the state of Rhode Island. Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA), 16 U.S.C. 1455b, requires states and territories with coastal zone management programs that have received approval under section 306 of the Coastal Zone Management Act to develop and implement coastal nonpoint programs.

For purposes of this environmental assessment, the proposed action is the conditional approval of the Rhode Island coastal nonpoint program. The Rhode Island program includes the implementation of management measures for urban, marina, and hydromodification nonpoint source categories, and for wetlands, riparian areas, and vegetated treatment systems. The agricultural source category is excluded, except for implementation of management measures for confined animal facilities and for nutrient management as it applies to the application of manure to agricultural lands. The program excludes the forestry source category. Because the boundary of the Rhode Island 6217 management area encompasses the entire state, the coastal nonpoint program will be implemented statewide.

NOAA and EPA find that the Rhode Island program meets most of the requirements of section 6217 and will approve the program with conditions. To receive final approval of its program, Rhode Island will need to meet the conditions which include developing a monitoring plan and completing development of certain aspects of its programs addressing agricultural, urban, and hydromodification sources, as well as the protection of wetlands and riparian areas.

The conditional approval of the Rhode Island coastal nonpoint program will not result in any significant adverse environmental impacts and will have an overall beneficial effect on the environment.

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RHODE ISLAND
COASTAL NONPOINT POLLUTION CONTROL PROGRAM

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EXECUTIVE SUMMARY

The National Oceanic and Atmospheric Administration (NOAA) has prepared this environmental assessment to assess the environmental impacts associated with the approval and implementation of the coastal nonpoint pollution control program (coastal nonpoint program) submitted to NOAA and the Environmental Protection Agency (EPA) by the state of Rhode Island. Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA), 16 U.S.C. section 1455b, requires states and territories with coastal zone management programs that have received approval under section 306 of the Coastal Zone Management Act to develop and implement coastal nonpoint programs. These programs were required to be submitted to NOAA and EPA in July 1995. Once approved, these programs will be implemented through changes to the state nonpoint source program approved by EPA under section 319 of the Clean Water Act and through changes to the state coastal zone management program.

For purposes of this environmental assessment, the proposed action is the conditional approval of the Rhode Island coastal nonpoint program. The alternatives to the proposed action are to approve the program or to deny approval of the program.

The Rhode Island coastal nonpoint program includes the implementation of management measures for urban, marina, and hydromodification nonpoint source categories, and for wetlands, riparian areas, and vegetated treatment systems. The agricultural source category is excluded, except for implementation of management measures for confined animal facilities and for nutrient management as it applies to manure. The program excludes the forestry source category.

The boundary of the 6217 management area proposed by Rhode Island conforms with the NOAA/EPA recommendation and encompasses the entire state. Therefore, the Rhode Island coastal nonpoint program will be implemented statewide.

NOAA and EPA find that the Rhode Island coastal nonpoint program meets most of the requirements of section 6217 and will be approved with conditions. To receive final approval of its program, Rhode Island will need to meet the conditions which include developing a monitoring plan and completing development of certain aspects of its program addressing agricultural, urban, and hydromodification sources, as well as the protection of wetland and riparian areas.

NOAA and EPA have determined that the conditional approval of the Rhode Island coastal nonpoint program will not result in any significant adverse environmental impacts and that this alternative will have an overall beneficial effect on the environment.

1. OVERVIEW

1.A Background

In 1990, Congress enacted section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA), entitled "Protecting Coastal Waters", to help address the problem of nonpoint source pollution and its effect on coastal waters. The purpose of the section is to strengthen the links between Federal and state coastal zone management and water quality programs in order to enhance state and local efforts to manage land use activities that degrade coastal waters and habitats. Section 6217 requires states and territories with federally approved coastal management programs to develop coastal nonpoint pollution control programs (coastal nonpoint programs) and submit them to the National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA) in July 1995 for approval. Once approved, these programs will be implemented through changes to the state nonpoint pollution program approved by EPA under section 319 of the Clean Water Act (CWA) and through changes to the state or territorial coastal zone management program approved by NOAA under the CZMA.

Section 6217 utilizes a two-tiered management approach for the control of nonpoint sources of pollution. The purpose of the first tier is to protect coastal waters generally. It requires that states and territories implement, at a minimum, management measures in conformity with guidance that was developed by EPA in consultation with NOAA and other Federal agencies. The management measures developed by EPA address the nonpoint pollution source categories of urban runoff, agricultural runoff, forestry runoff, hydromodification, and marinas. Management measures must also be implemented for wetlands protection, riparian areas, and vegetated filter strips. Once the first tier of management measures are implemented to protect coastal waters generally, the state or territory will need to develop additional management measures to apply, as necessary, to meet water quality standards and protect designated uses.

1.B Purpose and Need for Action

In March 1996, NOAA published a programmatic environmental impact statement (PEIS) that assessed the environmental impacts associated with the approval of state and territory coastal nonpoint programs. The PEIS forms the basis for the environmental documents NOAA is preparing on each state and territorial coastal nonpoint program submitted for approval. In the PEIS, NOAA determined that the approval and conditional approval of coastal nonpoint programs will not result in any significant adverse environmental impacts and that these actions will have an overall beneficial effect on the environment. The analyses presented in the PEIS are incorporated by reference into this environmental assessment (EA).

NOAA has prepared this EA to assess the environmental impacts associated with the approval and implementation of the coastal nonpoint program submitted to NOAA and EPA by the state of Rhode Island on July 19, 1995. The Rhode Island program will be approved after a joint NOAA/EPA review if it meets all of the requirements of section 6217 as specified in the statute and in the guidance documents for the program. The analysis in this EA also serves to determine whether the impacts associated with program approval are significantly different

from those analyzed in the PEIS, so as to require the preparation of an environmental impact statement (EIS).

In 1978, NOAA prepared a final environmental impact statement (FEIS) on the Rhode Island coastal management program submitted for approval under the Coastal Zone Management Act of 1972. The Rhode Island coastal management program establishes the boundaries of the coastal area within which the program applies; describes the organizational structure to implement the program; and provides a set of statewide policies applicable to all state and Federal agencies which manage resources along the state's coastline. The information in the FEIS is relevant to this analysis because the section 6217 coastal nonpoint program is to be implemented through the Rhode Island coastal zone management program, as well as its section 319 Clean Water Act program. Therefore, the Rhode Island FEIS is incorporated by reference into this EA.

2. ALTERNATIVES

For purposes of this environmental assessment, the proposed action is the conditional approval of the Rhode Island coastal nonpoint program. The alternatives to the proposed action are to approve the program or to deny approval of the program. The proposed action, its alternatives, and a summary of their environmental consequences are described below.

2.A Approval of the Rhode Island Coastal Nonpoint Program

To assist states and territories in the development of their coastal nonpoint programs, NOAA and EPA jointly published a program development and approval guidance document (NOAA/EPA, 1993). The state and territory programs will be approved after a joint NOAA/EPA review if they meet all of the requirements of section 6217 as specified in the statute and in the program guidance documents. Specifically, the Rhode Island program must contain the following components:

- o Coordination with Existing State Programs
- o Determination of the 6217 Management Area
- o Implementation of Management Measures in Conformity with (g) Guidance
- o Identification and Implementation of Additional Management Measures
- o Technical Assistance
- o Public Participation
- o Administrative Coordination
- o Identification of Enforceable Policies and Mechanisms

The alternative of approving the Rhode Island coastal nonpoint program would generally be expected to have a beneficial effect on the environment because it would help to control sources of nonpoint pollution and would result in fewer pollutants reaching the state's coastal waters. For example, the nonpoint program will help to control urban runoff of the sediment, nutrients, heavy metals, pathogens and petroleum products that contaminate Narragansett Bay and the Providence River. The program will help to control stormwater runoff and leakage from failed septic systems that add pollutants, including coliform bacteria, to areas such as Greenwich Bay, Narrow River, and the Salt Ponds. The nonpoint program will also make existing programs more effective by strengthening the link between Federal and Rhode Island state coastal zone management and water quality programs. In their review of the Rhode Island program, NOAA and EPA have found that the program does not meet all of the requirements of section 6217. Therefore, full approval of the Rhode Island coastal nonpoint program is not a feasible alternative. The rationale for this decision is discussed below under the conditional approval alternative. However, as discussed below, the conditional approval alternative is expected to result in the same environmental benefits as the approval alternative, provided Rhode Island satisfies the conditions.

2.B Conditional Approval of the Rhode Island Coastal Nonpoint Program
[Preferred Alternative]

NOAA and EPA expect the coastal nonpoint programs submitted for approval to meet all of the requirements of section 6217. NOAA and EPA realize that in some situations, a program may require changes before final approval can be granted. In these situations, NOAA and EPA will grant conditional approval in order to provide states and territories an opportunity to make necessary changes. Conditional approvals are intended primarily to provide additional time to:

(1) address identified gaps, including obtaining new statutory or regulatory authority, if necessary;

(2) demonstrate that existing authorities are adequate for ensuring implementation of the management measures; and,

(3) develop other incomplete program components.

NOAA and EPA will provide up to five years from the time of conditional approval for completion of a coastal nonpoint program. The length of the conditional approval will depend on which program components are subject to conditions and how long it will take to finalize those components.

NOAA and EPA find that the Rhode Island coastal nonpoint program meets most of the section 6217 requirements and adequately addresses all program components with the exception of the following components. The state will be able to receive final approval of its program by meeting the conditions described below for each component.

(1) *Agricultural Runoff*

Rhode Island has demonstrated that agriculture as a nonpoint source category can be excluded from the State's coastal nonpoint program with the exception of the measures for confined animal facilities and nutrient management as it applies to animal waste. In order to receive final approval, the program must meet the following conditions:

- Within three years, Rhode Island will demonstrate the State's ability to achieve widespread implementation of the management measures for confined animal facilities and nutrient management as it applies to animal waste agricultural management measures using the approach discussed below under agricultural management measures in the Environmental Consequences section (section 4.A.1.a) of this EA. Within one year, the State will identify measurable results to be achieved during this three year timeframe.

(2) *Urban Runoff - Construction Site Chemical Control Management Measure*

Rhode Island's program does not yet provide for implementation of management measures in conformity with the 6217(g) guidance and does not yet have enforceable policies and mechanisms to ensure implementation throughout the management area. In order to receive final approval, the program must meet the following conditions:

- Within three years, Rhode Island will finalize amendments to RICRMP Section 300.2 to implement the management measures within the jurisdiction of CRMC, and amend its *Soil Erosion and Sediment Control Handbook* to incorporate the elements of the measure and

ensure implementation in areas outside of CRMC jurisdiction.

(3) *Urban Runoff - New Onsite Disposal Systems and Operating Onsite Disposal Systems (OSDS) Management Measures*

Rhode Island's program contains management measures in conformity with the (g) guidance, except that the state does not have measures for inspection of operating OSDS and protection of nitrogen-limited surface waters. Rhode Island's program includes enforcable policies and mechanisms to ensure implementation. In order to receive final approval, the program must meet the following condition:

- Within three years, Rhode Island will develop a strategy to address inspections of existing OSDS and make necessary program changes to address nitrogen-limited surface waters.

(4) *Hydromodification - Channelization and Channel Modification and Dams*

Rhode Island's program includes enforceable policies and mechanisms to ensure implementation and includes management measures in conformity with the (g) guidance for new channelization and new dam construction projects. The state program does not yet include management measures in conformity with the (g) guidance for existing sources. In order to receive final approval, the program must meet the following condition:

- Within three years, Rhode Island will develop a process to identify opportunities and, where appropriate, implement practices to improve the physical and chemical characteristics of surface waters and instream and riparian habitat in existing channels and protect surface water quality and instream riparian habitat at existing dams.

(5) *Wetlands and Riparian Areas - Protection of Wetlands and Riparian Areas Management Measure*

Rhode Island's program includes management measures in conformity with the (g) guidance and includes enforceable policies and mechanisms to ensure implementation for activities that alter or modify wetlands and riparian areas that serve a significant nonpoint source abatement function. The program does not protect other wetlands and riparian areas that serve a significant nonpoint source abatement function but are not associated with environmental permits for new work. In order to receive final approval, the program must meet the following condition:

- Within three years, the state will develop a process to identify opportunities and, where appropriate, implement practices to protect existing wetlands and riparian areas that are not being actively altered but that serve a significant nonpoint source abatement function.

(6) Monitoring

The Rhode Island program does not include a plan to assess over time the success of the management measures in reducing pollutant loads and improving water quality as specified in section 6217(g)(2)(F). To receive final approval, the program must meet the following condition:

• Within two years, Rhode Island will develop a plan that enables the State to assess over time the extent to which implementation of management measures is reducing pollutant loads and improving water quality.

The alternative of conditionally approving the Rhode Island coastal nonpoint program is expected to have the same beneficial results as would full approval and will avoid the adverse impacts associated with denial of approval, provided Rhode Island satisfies the conditions. The immediate implementation of the completed portions of the program will begin to fulfill the intent of section 6217 by helping to control sources of nonpoint pollution thus resulting in a reduction of pollution reaching coastal waters. Positive socioeconomic benefits will accrue as improvements in coastal water quality resulting from controlling nonpoint pollution increase the aesthetic value of coastal areas thereby benefiting tourism and providing enhanced opportunities for boating and swimming and other water related activities. Improvements in water quality are also likely to improve shellfish harvesting and fisheries. There may be some slight and localized socioeconomic impacts from implementation of management measures and because of restrictions that may result from designation of critical coastal areas.

2.C Deny Approval of the Rhode Island Coastal Nonpoint Program [No Action]

The decision to deny approval of a coastal nonpoint program has the same effect as the "no action" alternative under the National Environmental Policy Act. Although section 6217 requires states to develop and implement coastal nonpoint programs, approval of the programs is not assured until NOAA and EPA find that all the requirements of section 6217 have been met. Denial of approval of a program will have the effect of relying on existing nonpoint control efforts and levying financial penalties on both the state's coastal zone management program and the state's nonpoint pollution program under section 319 of the Clean Water Act. The schedule for such penalties is stipulated in section 6217(c) of the CZARA. The denial of program approval and the imposition of financial penalties may have an adverse environmental effect because it may cause Rhode Island not to implement management measures that are meant to control coastal nonpoint pollution, restore degraded waters, and protect critical coastal areas.

There are many specific examples of how nonpoint pollution has caused significant water quality problems in the poorly flushed estuaries and coastal embayments of Rhode Island. Although the majority of estuarine and coastal waters fully support designated uses, including fishing and swimming, the Rhode Island water quality assessment report (RIDEM, 1992) states that nine percent of these coastal waters do not support designated uses. Restrictions on uses are caused by heavy metals and low dissolved oxygen in the Providence River, low dissolved oxygen in Greenwich Bay and the coves of the Palmer River, and coliform bacteria in the shellfishing areas of Greenwich Bay. Shellfishing areas in Greenwich Bay and the Narrow River have been closed by failed septic systems and stormwater runoff. Elevated levels of fecal coliform bacteria have closed bathing beaches and harvesting of quahogs in portions of Narragansett Bay.

NOAA and EPA have reviewed the Rhode Island coastal nonpoint program and found that the program meets most of the requirements of section 6217. Therefore, denying approval of the program is not a feasible alternative.

3. AFFECTED ENVIRONMENT

As required by section 6217(a) of the CZARA, the geographic scope of each coastal nonpoint program must be sufficient to ensure implementation of management measures to "restore and protect coastal waters." Pursuant to section 6217(e), NOAA, in consultation with EPA, made recommendations to each state and territory on the geographic scope of its program (also known as the "6217 management area"). This recommendation was based on the extent of coastal watersheds in each state and territory. A state or territory was not required to adopt NOAA's exact boundary recommendation; they could propose an alternative 6217 management area at the time of program submission.

The boundary of the 6217 management area proposed by Rhode Island conforms with the NOAA/EPA recommendation and encompasses the entire state.

Because the actual geographic scope of each coastal nonpoint program was unknown during the preparation of the PEIS, that document used NOAA's original recommendation - coastal watersheds - for purposes of generally describing the environment to be affected. The description of the environment in the PEIS was of a general nature because of the widely diverse areas encountered across all of the twenty-nine states and territories that were expected to submit coastal nonpoint programs. The description of the environment in the Rhode Island 6217 management area is based on the PEIS, the EIS prepared by NOAA during approval of Rhode Island's coastal zone management program, and the Rhode Island coastal nonpoint program submission.

3.A The Physical Environment

1. The Rhode Island 6217 Management Area

As stated above, NOAA selected coastal watersheds as its basic recommendation for all state and territory 6217 management areas. After evaluating all coastal watersheds in Rhode Island for significant indicators of pollution potential, NOAA and EPA recommended to Rhode Island that a 6217 management area which encompasses the entire state is necessary "to control sources of pollution that, individually or cumulatively, significantly impact the state's coastal waters". The Rhode Island 6217 management area encompasses the entire state, therefore the coastal nonpoint program will be implemented statewide. Figure 1 shows the coastal watersheds, the coastal watershed boundary, and the coastal zone boundary for Rhode Island.

2. Coastal Environment

Rhode Island is the smallest state in the United States in terms of land area. It encompasses an area of 1,028.4 square miles. Within this small area are over 400 miles of coastline and 193 square miles of estuarine area. The state also has extensive freshwater resources, with 357 lakes and ponds, which encompass over 16,749 acres, 21 major ground water aquifers, and 724 miles of rivers and streams (EPA, 1994; RIDEM, 1992; RIDOP, 1989).

The Rhode Island coastal region is located in the Virginian biogeographic province. This province, which extends from Cape Cod to Cape Hatteras, is broadly characterized by a primarily temperate biota with some boreal representatives. The tidal range is moderate. The Labrador Current flows southward along the coast.

Rhode Island's terrain ranges from flat coastal lowlands on the west shore of Narragansett Bay and adjoining the Atlantic Ocean, to hilly upland in the northwestern part of the state. The entire state was once covered with glacial ice sheets up to a mile in thickness.

Rhode Island's coastal environment can be divided into neritic, estuarine, and shoreline systems.

- The neritic systems, which include Rhode Island and Block Island Sounds, are transitional areas between open ocean and estuarine environments. They are primarily influenced by external oceanographic processes such as tides and currents. Plankton populations are intermediate between those found in estuarine and oceanic waters. Because Rhode Island is on a boundary between northern and southern fish populations, its waters possess a diversity of species. Mackerel, cod, butterfish, weakfish, and cunner spawn in Block Island Sound. Glacially-deposited sand and gravel deposits are found on large areas of the seafloor.

- The estuarine systems, including Narragansett Bay, Point Judith Pond, and the Pettaquamscutt River, are defined as semi-enclosed coastal bodies of water with free connection to the open sea within which seawater is measurably diluted with freshwater derived from land drainage (Pritchard, 1967). NOAA's National Estuarine Inventory (NOAA, 1990a) classifies Rhode Island as being part of the Middle Atlantic Estuarine Drainage Area. Estuaries in this region are very susceptible to pollutant retention because of their relatively large volumes, moderate to low freshwater inflow, and low tidal exchange. They were formed by rising sea level that drowned the mouths of rivers extending across the continental shelf.

Rhode Island's estuarine systems exhibit high biological productivity and diversity. Phytoplankton, macroalgae, eelgrass, and benthic microalgae provide an abundant and varied food supply which supports large and diverse faunal populations, such as birds, shellfish, and finfish. Estuaries and coastal ponds contribute directly to the productivity of the state commercial and recreational fisheries. They are especially valuable as nursery areas for finfish. Estuaries and adjacent marshes provide habitat for migrating and nesting waterfowl and shorebirds. Rhode Island's central position in the Atlantic flyway makes its estuarine habitats particularly important during migration.

Commercially important estuarine benthic animals include the quahog, lobster, surf clam, blue mussel, rock crab, and Jonah crab. Oceanic fishes such as bluefish, scup, striped bass, and menhaden make seasonal migrations into estuarine waters.

Narragansett Bay is one of 21 estuaries participating in the U.S. Environmental Protection Agency's National Estuary Program. The Bay extends twenty-eight miles inland from the open ocean and covers 147 square miles of water surface (RIDOP, 1992). It is connected to Rhode Island Sound through three ancient, drowned river valleys. Circulation within the Bay affects the distribution of pollutants, nutrients, and plankton. Although the net nontidal movement of water in the Bay is downstream from the rivers to Rhode Island Sound, tidal currents, which average one-and-a-half knots, are the most important force affecting circulation and mixing of the Bay waters. The most common type of shoreline found around

Narragansett Bay is a narrow gravel and cobble beach that backs up to a scarp or bluff composed of glacial till. Sandy beaches are found along the ocean shores at the mouth of the Bay. Salt marshes cover about 2800 acres of land around the Bay; an additional 4400 acres are tidal flats.

- The shoreline systems include the state's entire intertidal zone and associated coastal beaches, cliffs, ledges, bluffs, wetlands, barrier beaches, and sand dunes. Wide sandy beaches, steep cobble beaches, and seacliffs are found along the open ocean. Low bluffs, sandy to muddy shores, and coastal wetlands are found in estuaries and coastal ponds. According to the National Wetlands Inventory of 1989, Rhode Island contains approximately 7,949 acres of coastal wetlands (931 acres of marine wetlands and 7,018 acres of estuarine wetlands). Among the distinctive physiographic features of Rhode Island's ocean shoreline are its coastal ponds. The ponds were created thousands of years ago when longshore currents formed a sand spit between the headlands of the south shore and the Block Island shorelines. The salt ponds provide commercial and recreational fisherman with harvests of quahogs, oysters, scallops, flounder, and other species of finfish. They also provide spawning and nursery habitat for winter flounder and several other commercially important species of finfish. The ponds are believed to be the spawning grounds and nurseries for a major portion of the Block Island Sound winter flounder population (CRMC, 1993).

Barrier beaches are narrow strips of land composed of unconsolidated material extending parallel to the coast and separated from the mainland by a relatively narrow body of fresh, brackish or saltwater, or a wetland. Rhode Island has approximately 27 miles of barrier beaches (NOAA, 1978). Barrier beaches and their associated sand dunes and wetlands normally serve as natural storm buffers that protect the lands and waters behind them. However, the south shore barrier beaches are sand-starved and have a narrow and low profile, which makes them susceptible to erosion and overwash.

The entire south shore of Rhode Island is highly susceptible to flooding and damage from coastal storms because the ocean shoreline extends in an east-west direction putting it directly in the path of most major hurricanes that reach New England. The glacial sediments of the bluffs, headlands, and sand dunes also are susceptible to erosion from storm surges and waves.

Cliffs, bluffs, and ledges serve important functions in maintaining coastal ecosystems. Coastal bluffs, composed of highly erodible unconsolidated sediments, mainly glacial till, erode more rapidly than cliffs. Eroding coastal bluffs may provide an important source of sand to nearby beaches. The dense growth of seaweed found at the base of many cliffs and ledges may contribute to the overall productivity of coastal waters. Some cliffs and bluffs provide important nesting sites for birds. Many coastal cliffs and bluffs have been designated as coastal natural areas.

3.B Terrestrial Environment and Land and Water Uses

This section provides a description of the terrestrial environment and the land and water users and uses in the Rhode Island 6217 management area. The Rhode Island coastal zone supports extensive and varied commercial and recreational activities. The intensity and nature of land and water uses in many areas has threatened and degraded coastal water quality.

1. Population

The most recent population data from the 1990 census indicate that Rhode Island has a population of 1,002,000 people. This represents a 6 percent increase from 1980, with the greatest increase being in suburban and coastal communities. Population projections estimate an additional 6 percent increase in population from 1990 to 2010. Most of the population is situated in Rhode Island's coastal communities, especially those located within the Narragansett Bay Watershed. This watershed is one of the most densely populated in the country with approximately 1.8 million people residing in an estuarine drainage area of approximately 1300 square miles. In 1988, Rhode Island had a coastal population of 2,585 people per shoreline mile; this is projected to increase to 2,881 people per shoreline mile by the year 2010 (NOAA, 1990b). The areas where growth is projected to increase the most are rural areas such as Charlestown and Richmond. This increase in urbanization of rural areas will result in the conversion of agricultural and forested lands into urban and suburban land uses.

2. Social and Economic Activities

The type and extent of land and water uses in the 6217 management area is an indication of the pollutants entering Rhode Island coastal waters and the extent to which the environment of the surrounding watershed has been altered. The development of urban, agricultural, and forested lands and the activities associated with them alter the landscape and generate most of the pollutants entering coastal waters.

a. Agriculture

Agricultural activities in Rhode Island continue to decline. Farms comprise approximately 5 percent of land use, but farmland in production, i.e., used actively for crops, nursery, turf, and livestock operations, amounts to less than 3 percent of land use. In 1990, farmers maintained only 399 operations averaging 44 acres in production and totaling under 20,000 acres statewide. Much of the farmland is used for low intensity agriculture. Field crops like turf, pasture, and hay account for 10,282 acres, or over half of productive farmland (Table 1).

TABLE 1
Rhode Island Crops of
Over 1000 Acres in 1990

Crop	Acres
Hay	5,702
Turf	3.384
Corn	2,430
Nursery Stock	2,082
Potatoes	1,232
X-mas Trees	1,200
Pasture Land	1,196
Other	2,400
TOTAL	**19,626**

Livestock operations are also of limited size and extent and continue to decline in Rhode Island (Table 2). In 1993, all livestock in the state made up only fourteen percent of

agricultural revenues.

TABLE 2
Kind, Number and Size of
Livestock Operations in Rhode Island

Farm Type	No. of Farms	Animal Head	Av.Head/Farm
Poultry	9	266,000	29,556
Dairy	39	3,628	93
Hog	17	9,600	565
Beef Cattle	30	1,016	34

The continuing decline in production farmland in Rhode Island is caused by the conversion of coastal farmland to residential development and by a move to less intensive agricultural uses. Because of the growth of population in coastal counties, very few coastal towns sustain large agricultural tracts. Two major Rhode Island farm types, nurseries and potato farms, declined sharply over the last 10 years because they have been converted to less intensive agriculture such as turf cropping. The 14 turf operations in Rhode Island represent approximately half of a percent of land use in the state.

b. Forestry

The United States contains six major "natural forest regions" that are primarily defined by their uniqueness in their mix of species, climate, and physiography. Rhode Island forests are part of the Northern Forest region. This region is predominantly covered with hardwood forests. Maple-birch, aspen-birch, and oak-hickory are the major forest types. The major softwood type is spruce-fir.

The state publication *Land Use 2010* (RIDOP, 1989) presents some interesting facts about Rhode Island forests. During Colonial times, about three-quaters of Rhode Island was cleared for agriculture. By 1935, a third of this agricultural land was left uncultivated and allowed to naturally revert to forest land. By 1952, an estimated 430,500 acres or 67 percent of the state was forested.

Today, although forestland covers about 400,000 acres or 60 percent of the state, forestry activities are very limited and continue to decline in size and number. Annual removals of growing stock from 1972 to 1984 averaged 4.2 million cubic feet. From 1990 to 1992, timber harvests averaged approximately 330,000 cubic feet. In 1992 only 130,000 cubic feet of timber were removed overall. Of this 1990-1992 harvest, very little cutting occurred in any of the first coastal towns (first coastal towns are the 21 municipalities which border, at least in part, on tidal waters). Only 14.4 percent was taken from coastal towns while 85.6 percent was taken from non-coastal towns.

Urbanization is the primary reason for the decline in forestry activities in Rhode Island. Most contiguous forest tracts have been divided into small residential lots. In 1985, private citizens owned over 320,000 acres (about 87 percent) of the state's harvestable forestland with lots averaging less than 10 acres. While 45,000 acres of state forestland is publicly owned, the forest industry owns only about one percent of the total (Table 3).

TABLE 3
Rhode Island Forestland
Ownership in 1985

Ownership Class	Forestland Owned (1000 acres)
Public	45.2
Private - Forest Industry	4.4
Private - Non Forest Industry	322.2
All Ownership	371.8

c. Urban

As previously mentioned, the 1990 Census indicates that Rhode Island has a population of 1,002,000 people. Although this ranks Rhode Island 42nd among the 50 states, it is the second most densely populated state, with approximately 975 persons per square mile. This is indicative of why urban runoff is a major source of nonpoint pollution to Rhode Island's coastal waters.

All the land in Rhode Island is contained in 39 incorporated municipalities: eight cities and 31 towns. While the center of population remains in and around the city of Providence, the fastest growth is taking place in the 21 coastal towns and the rural western towns. The areas where growth is projected to increase the most are rural areas such as Charlestown and Richmond. Permits for new single family houses in coastal towns totaled 1318 in 1990 and 1107 in 1991. Non-coastal permits for new homes totaled 947 in 1990 and 943 in 1991.

The heavily developed and industrialized areas of Providence, East Providence, Warwick, and Cranston are major nonpoint sources to the upper Narragansett Bay. According to 1985 estimates, approximately 60 percent of Rhode Island's population is served by sewers, however, in terms of land area, the majority is unsewered. Sewer service is provided for the most densely developed areas. Individual Sewage Disposal Systems (ISDS) are primarily used in areas where sewers are not available, in areas with sparse populations, and areas with a large seasonal population. Approximately 40 percent of the state population (143,900 households) use individual sewage disposal sysyems (ISDS). Roads and bridges are a source of nonpoint pollution to coastal waters. Rhode Island has 6,275 miles of roads covering an area of 1,049 square miles. That equals six road miles per square mile of land, a greater road density than any other state. There are also 725 bridges in this road network.

d. Marinas

Recreational boating activities are a major use of Rhode Island's coastal waters. Over 32,000 boats are registered with the Rhode Island Department of Environmental Management's (RIDEM) Division of Boater Registration. An estimated additional 18,000 recreational boats are registered with other states, or are not required to register but use the coastal waters. A large majority of boaters use marinas, mooring fields, and public launching ramps to access the water. Table 4 shows the number of marina facilities in Rhode Island; Table 5 shows the types of marina facilities.

TABLE 4. Number of Marina Facilities in Rhode Island

Marinas	107
Yacht Clubs	16
Boatyards	34
Drystack Marinas	2
Dockominiums	1

TABLE 5. Type of Marina Facilities in Rhode Island

Slips	9,462
Drybays	3,128
Moorings	2,599
Launching Ramps	49

While marinas are found in almost every coastal town, some communities have a larger percentage of facilities. Warwick, with twenty, has the most marinas. South Kingston and Newport have fifteen, and Westerly has twelve. There also were 6,924 public mooring areas in municipal mooring fields statewide during the 1993 boating season. Small mooring fields of 25 boats or less are found in small coastal embayments; large mooring fields with almost 1,000 boats are found in Newport Harbor and Jamestown Harbor. The total number of marina moorings and marina slips in Rhode Island is estimated to be 13,043.

e. Fisheries

The economic viability of the Rhode Island commercial and recreational fisheries is dependent on the quality of coastal waters. There are 2,921 vessels in Rhode Island's commercial fishing fleet. In 1993, they caught nearly 121 million pounds of seafood worth more than $76 million (Coast Alliance, 1995). Commercial fish landings for the years 1988 to 1991 showed yearly increases. Landings increased from 106.2 million pounds in 1988, to 125.0 million pounds in 1989, 131.8 million pounds in 1990, and 139.8 million pounds in 1991 (COPR, 1992). According to the National Shellfish Register of Classified Estuarine Waters (NOAA, 1991), only about 2,000 pounds of oysters were landed in Rhode Island between 1985 and 1989. Clam landings declined from about six million to slightly more than four million pounds during the same period. Scallop landings declined from 22,000 pounds in 1985 to zero in 1986 because of brown tide infections.

4. ENVIRONMENTAL CONSEQUENCES

Management measures are defined in section 6217 as economically achievable measures to control the addition of pollution to coastal waters, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. As required by the statute, EPA developed guidance (USEPA, 1993) specifying management measures for the following nonpoint pollution source categories: agricultural runoff; urban runoff; forestry runoff; marinas; hydromodification; and wetlands, riparian areas, and vegetated treatment systems. Coastal nonpoint programs must provide for the implementation of management measures that are in conformity with this guidance. The guidance also lists and describes management practices that EPA has found to be representative of the types of practices that can be applied sucessfully to achieve the management measures. State and territory programs are not required to specify practices, but must include a process for selection of practices that will achieve the measures.

NOAA's PEIS discussed the fifty-six management measures and their function in preventing environmental degradation caused by the pollutants associated with each nonpoint source category. Each coastal nonpoint program must address each of the management measures by either: (1) providing for the implementation of that measure or an alternative as effective, or (2) justifying why the management measure is not included in the program. States and territories may exclude nonpoint source categories or subcategories where the sources do not exist or do not, individually or cumulatively, present significant impacts to coastal waters.

4.A MANAGEMENT MEASURES IMPLEMENTATION

1. ENVIRONMENTAL IMPACTS

The Rhode Island coastal nonpoint program provides, with exceptions, for the implementation of management measures for urban, marina, and hydromodification nonpoint source categories, and for wetlands, riparian areas, and vegetated treatment systems. Three management measures addressing confined animal facilities and nutrient management are included for the agriculture source category. The remaining measures addressing erosion from cropland, pesticide application, grazing management, and irrigation of cropland are excluded. The program excludes the forestry source category. The full text of all management measures and a statement of their applicability can be found in Appendix A.

a. **Agricultural Nonpoint Pollution Source Category**

In their coastal nonpoint program submittal, Rhode Island proposed a categorical exclusion of agriculture. However, information on the number of animals and the amount of animal waste generated in the 6217 management area and the proximity of these facilities to coastal waters indicates that the program should address the management measures for Facility Wastewater and Runoff from Confined Animal Facilities (large and small units) and the portions of the Nutrient management measure that apply to application of animal waste to agricultural lands. Rhode Island's program has demonstrated that agriculture is generally not a significant contributor of pollutants to its coastal waters and that agriculture as a land use is declining statewide. The amount of farmland used for crops, nursery, turf, and livestock

operations has continued to decline. In 1990, farmers maintained only 399 operations averaging 44 acres in production and totaling under 20,000 acres statewide. Over half of productive farmland (10,282 acres) is used for field crops such as turf, hay, and pasture. The continuing decline in the amount of farmland in production is caused by the conversion of coastal farmland to residential development and by a move to less intensive agricultural field crops such as turf, pasture, and hay. Although livestock operations in Rhode Island are limited in size and extent, they still present potential nonpoint source impacts to water quality. There are 39 dairy, 9 poultry, 17 hog, and 30 beef farms in Rhode Island. These farms are distributed throughout each of the counties of the State and, with the exception of the beef operations, most meet the applicability thresholds described in the 6217(g) guidance. Because of their proximity to coastal waters, these operations present a threat to coastal waters both by discharge from the operations themselves and from land application of animal waste.

According to the Comprehensive Conservation and Management Plan for Narragansett Bay (RIDOP, 1992), runoff from agricultural land is a source of nutrients, especially nitrogen and phosphorus, to the Bay. The Special Area Management Plan for the Rhode Island Salt Pond Region (CRMC, 1993) states that fecal material from livestock carried by runoff is a source of bacterial contamination to the Salt Ponds. The plan also states that agriculture is responsible for most of the nitrogen loading to Trustom and Cards Ponds.

Management measures for the following two subcategories of sources of agricultural nonpoint pollution that affect Rhode Island's coastal waters will be implemented as part of the State's coastal nonpoint program:

- o Confined animal facilities
- o Nutrient management as it applies to animal waste

The Environmental Consequences section of the PEIS contains a description of the primary pollutants in agricultural runoff and an analysis of the impacts of these pollutants on water quality. The management measures are designed to prevent the environmental degradation caused by these pollutants.

The problems associated with large and small animal facilities result from runoff, facility wastewater, and manure. Application of the two management measures will reduce the volume of runoff and manage manure and facility wastewater, thereby improving water quality and protecting Rhode Island's coastal waters. These measures eliminate the pollutants leaving a facility by storing runoff for large facilities and using practices that reduce the amount of water that comes into contact with animal waste.

The problems associated with the application of animal wastes to agricultural lands include the migration of nutrients into ground and surface waters and the degradation of water quality. The goal is to minimize edge-of-field delivery of nutrients and the leaching of nutrients from the root zone. This measure will reduce the amount of nutrients entering both ground and surface waters and promote more efficient use of all sources of nutrients available to the producer.

The implementation of management measures for agricultural nonpoint pollution, based on the existing State programs and authorities discussed below, will result in broader, more widespread implementation of the management measures with the resulting environmental benefits associated with a reduction in agricultural nonpoint pollution.

Management Measures for Agricultural Sources

1. *Management Measure for Facility Wastewater and Runoff from Confined Animal Facility Management (Large and Small units)*

These management measures are intended to be applied to confined animal facilities. Application of these measures will reduce the volume of runoff, manure, and facility wastewater reaching a waterbody.

Management measures for large and small confined animal facilities will be implemented by the following programs:

- Rhode Island Department of Environmental Management (RIDEM), Division of Water Resources. Rhode Island has authority under the State's *Water Quality Regulations for Water Pollution Control* to issue permits for confined animal facilities and take enforcement action against anyone who discharges agricultural wastes without a permit or in any manner that degrades water quality.
- An existing Memorandum of Understanding signed by RIDEM, the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) and Farm Services Agency (FSA) requires that agricultural projects be planned and designed in accordance with the NRCS Field Office Technical Guide, National Planning Procedures Handbook, and Agricultural Waste Management Field Handbook. These documents include practices that are in conformity with the 6217(g) guidance. Rhode Island's voluntary programs, administered by the RIDEM Division of Agriculture, the NRCS and FSA, backed by the State's Water Quality Regulations, will be used to ensure implementation of the management measures.

2. *Nutrient Management Measure*

This management measure is intended to be applied to the application of animal wastes to to agricultural lands. Application of this measure will reduce the amount of nutrients entering both ground and surface waters.

The management measure for the application of nutrients will be implemented by the following programs:

- Refer to programs listed above for confined animal facilities.

Conditions

These three agricultural management measure are approved subject to the following conditions:

- Within three years, Rhode Island will demonstrate the State's ability to achieve widespread implementation of the management measures using the approach discussed above for the programs and authorities to be used to implement these agricultural management measures. Within one year, the State will identify measurable results to be achieved during this three year timeframe.

b. Urban Nonpoint Pollution Source Category

Because Rhode Island is highly urbanized and is the second most densely populated state in the nation, urban runoff is a major source of nonpoint pollution to its coastal waters. Section 3.B.2.c of this EA provides information on the population and growth patterns in

Rhode Island.

Increased urbanization of rural areas has resulted in the conversion of agricultural and forested lands into urban and suburban land uses. The most recent population data from the 1990 census indicate that Rhode Island has a population of 1,002,000 people. Most of the population and much of the new development is located in Rhode Island's coastal communities, especially those located within the Narragansett Bay watershed. In 1988, Rhode Island had a coastal population of 2,585 people per shoreline mile. The areas where growth is projected to increase the most are areas such as Charlestown and Richmond.

Based on the results of RIDEM's 1992 305(b) report, the vast majority of Rhode Island's nonpoint source water quality problems are due to urban related causes. Identified urban sources of nonpoint pollution which are addressed in the (g) guidance include sedimentation from construction sites, stormwater runoff from highways and developed areas, and septic systems. Runoff from heavily developed and industrialized areas of Providence, East Providence, Warwick, and Cranston are major nonpoint sources to the upper Narragansett Bay. Pollutants found in runoff include heavy metals, polycyclic aromatic hydrocarbons, petroleum products, sediments, nutrients, bacteria, and suspended solids. Stormwater runoff and Individual Sewage Disposal Systems (ISDS) are major sources of nonpoint source contamination to areas such as the Salt Ponds and Narrow River regions, as well as to Greenwich Bay.

The CRMC's Special Area Management Plan for the Salt Pond region recognized failing and substandard ISDS as the single most important source of bacterial contamination and nutrients to this region's coastal waters. In 1981 there were 5,502 ISDS units in the watershed of the salt ponds. Most of these ISDS, as well as the majority of the ISDS units statewide, predate the adoption of State standards and are defined as cesspools.

Management measures have been developed for the following six subcategories of sources of urban nonpoint pollution that affect Rhode Island's coastal waters:

- o Runoff from developing areas
- o Runoff from construction sites
- o Runoff from existing development
- o On-site disposal systems
- o General sources (households, commercial, and landscaping)
- o Roads, highways, and bridges

The Environmental Consequences section of the PEIS contains a description of the primary pollutants in urban runoff and an analysis of the impacts on water quality. The management measures are designed to prevent the environmental degradation caused by these pollutants.

The implementation of management measures for urban runoff will reduce the generation of nonpoint source pollutants from existing development and control runoff and treat pollutants associated with new development and redevelopment. The measures emphasize the control and removal of sediment and other suspended solids and pollutants entrained in runoff. The measures will minimize the transport of sediment and other pollutants (pesticides, fertilizers, petrochemicals, road salt, wood, garbage, paints and sealers) from new and existing development. The management measures pertaining to new and existing OSDS will reduce nutrient and pathogen loadings by: preventing the installation of conventional OSDS in areas

where soil absorption systems will not provide adequate treatment of effluents; and, requiring that existing OSDS be modified, operated, repaired, and maintained to reduce pollutant loadings. The measures will require that roads, highways, and bridges are sited, constructed, operated, and maintained in order to protect sensitive ecosystems and reduce the generation and runoff of sediment, road salt, and other pollutants.

The environmental benefits that result from the implementation of management measures for urban runoff using existing Rhode Island programs and authorities will be enhanced by the State's development of a model Stormwater Control Ordinance and incorporation of the proposed ordinance into local subdivision and zoning ordinances. The State's proposed completion of amendments to the section of the RICRMP pertaining to erosion and sediment control and amendment of its *Soil Erosion and Sediment Control Handbook* will ensure implementation of the three management measures for construction activities throughout the Rhode Island 6217 management area. The requirement for Rhode Island to address inspections of existing OSDS and to protect nitrogen-limited surface waters will provide an increased level of environmental protection by reducing loadings of nitrogen and bacteria to coastal waters. Increased environmental protection from road, highway, and bridge projects will result from the Federal Highway Administration Final Rule on sediment and erosion control as required under the Intermodal Surface Transportation Efficiency Act of 1991 that requires highway projects in coastal states to utilize the 6217(g) management measures for design of projects within their coastal areas.

Management Measures for Urban Areas

1. *New Development Management Measure*

This management measure is intended to be applied to control urban runoff and treat associated pollutants generated from new development, redevelopment, and new and relocated roads, highways, and bridges. The net result of this management measure will be increased watershed protection and a reduction in the erosion, flooding, and pollutants associated with poorly planned development.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program (RICRMP). The Coastal Resources Management Council (CRMC) will implement this measure in accordance with the permit requirements as specified in the Rhode Island Coastal Resources Management Program. This measure is currently implemented by the CRMC pursuant to the stormwater management requirements of the RICRMP.
- Rhode Island Department of Environmental Management (RIDEM), Division of Freshwater Wetlands Rules and Regulations. RIDEM will implement this measure in accordance with the requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act.* This management measure is currently implemented by the Division of Freshwater Wetlands and applies statewide to any activities that could alter the character of a freshwater wetland.
- State Acts Related to Land Use and Planning, including the development of a model Stormwater Control Ordinance that will be implemented through changes to local subdivision and zoning ordinances.

2. *Watershed Protection Management Measure*

This management measure is intended to be applied to new development or redevelopment including construction of new and relocated roads, highways, and bridges that generate nonpoint source pollutants. Application of this management measure will reduce the generation of nonpoint source pollutants and mitigate the impacts of urban runoff.

This management measure is or will be implemented by the following:

- Rhode Island Coastal Resources Management Program. The CRMC will implement this measure in accordance with the permit requirements as specified in the Rhode Island Coastal Resources Management Program. The permit process requires applicants proposing any activity within the Council's jurisdiction to apply for a CRMC Assent.
- RIDEM, Division of Freshwater Wetlands Rules and Regulations. RIDEM will implement this measure in accordance with the requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act.* This measure is currently implemented by the RIDEM, Division of Freshwater Wetlands and applies statewide to any activities that could alter the character of a freshwater wetland and contiguous areas.
- State Acts Related to Land Use and Planning and the *State Guide Plan.* This measure is currently implemented statewide through requirements contained in the Rhode Island Comprehensive Planning and Land Use Regulation Act, the Rhode Island Zoning Enabling Act, and the policies contained in the *State Guide Plan.*
- Rhode Island Public Drinking Water Protection Act of 1987. This legislation makes it a paramount policy of the state to protect the purity of present and future drinking water supplies by protecting aquifers, recharge areas and watersheds.

3. *Site Development Management Measure*

This management measure is intended to be applied to all site development activities including those associated with roads, highways, and bridges. Application of this management measure will reduce the generation of nonpoint source pollution and mitigate the impacts of urban runoff through proper design and development of individual sites.

This management measure is or will be implemented by the following:

- Rhode Island Coastal Resources Management Program. The CRMC will implement this measure in accordance with the permit requirements as specified in the Rhode Island Coastal Resources Management Program. Additional standards that apply to cases where filling, removing or grading activities are undertaken are proposed through changes to the RICRMP.
- RIDEM, Division of Freshwater Wetlands Rules and Regulations. RIDEM will implement this measure in accordance with the requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act.* This measure is currently implemented by RIDEM, Division of Freshwater Wetlands and applies statewide to any activities that could alter the character of a freshwater wetland and contiguous areas.
- State Acts Related to Land Use Planning, and the *State Guide Plan.* The requirements of this measure have been incorporated as a policy in the updated Rhode Island

Nonpoint Source Management Plan (NSMP). This NSMP will be incorporated as an element of the *State Guide Plan* as an official state policy. This will require all state agency policies and development activities that must be reviewed for compliance with the *State Guide Plan* to be done in a manner consistent with this policy.

4. ***Construction Site Erosion and Sediment Control Management Measure***

This management measure is intended to be applied to all construction activities on sites less than five acres in areas that do not have an NPDES permit in order to control erosion and sediment loss from those sites. This measure does not apply to: (1) construction of a detached single family home on a site of one-half acre or more or (2) construction that does not disturb over 5,000 square feet of land on a site. Application of this management measure will minimize the sediment being transported outside the perimeter of a construction site by reducing erosion and retaining sediment onsite.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program. The CRMC will implement this measure in accordance with the permit requirements as specified in the Rhode Island Coastal Resources Management Program. The permit process requires applicants proposing any activity within the Council's jurisdiction to apply for a CRMC Assent.
- RIDEM, Division of Freshwater Wetlands Rules and Regulations. RIDEM will implement this measure in accordance with the requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act.* This measure is currently implemented by the RIDEM, Division of Freshwater Wetlands and applies statewide to any activities that could alter the character of a freshwater wetland and contiguous areas.

5. ***Construction Site Chemical Control Management Measure***

This management measure is intended to be applied to all construction sites less than five acres in area and to new, resurfaced, restored, and reconstructed road, highway, and bridge construction projects. This management measure does not apply to: (1) construction of a detached single family home on a site of one-half acre or more or (2) construction that does not disturb over 5,000 square feet of land on a site. Application of this management measure will prevent the generation of pollutants at construction sites due to improper handling and usage, and prevent their movement from the construction site.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program. The CRMC will implement this measure pursuant to requirements in the RICRMP as revised in accordance with the conditions below.
- RIDEM, Division of Freshwater Wetlands Rules and Regulations. RIDEM will implement this measure in accordance with the requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act.* This measure is currently implemented by the RIDEM, Division of Freshwater Wetlands and applies statewide to any activities that could alter the character of a freshwater wetland. RIDEM will further implement this measure by using the revised *Soil Erosion and Sediment Control Handbook* in their permit review and enforcement activities.

Conditions

This management measure is approved with the following conditions:

- Within three years, Rhode Island will finalize amendments to RICRMP Section 300.2 to implement the management measure within the jurisdiction of CRMC, and amend its *Soil Erosion and Sediment Control Handbook* to incorporate the elements of the measure and ensure implementation in areas outside of CRMC jurisdiction.

6. ***Existing Development Management Measure***

This management measure is intended to be applied to all urban areas and existing development in order to reduce surface water runoff pollutant loadings from such areas. Application of this measure will protect or improve surface water quality by developing and implementing watershed management programs.

This management measure is currently implemented by the combination of requirements contained in the RIDEM's Water Quality Regulations and Freshwater Wetlands Program, the Coastal Resources Management Program, the Municipal Comprehensive Plans and related enabling legislation, and the Rhode Island Public Drinking Water Protection Act. Several additional watershed protection programs further enhance the implementation of this measure:

- Salt Ponds Special Area Management Plan
- Narrow River Special Area Management Plan
- Narragansett Bay Project CCMP
- Scituate Reservoir Watershed Management Plan

In addition, the revisions to the *Rhode Island Nonpoint Source Pollution Management Plan (NSMP)* that include both an updated implementation schedule and priority system will support implementation of this management measure. Rhode Island's Interagency Nonpoint Source Advisory Committee will assume a role in implementation by identifying pollution reduction, prevention, and education programs and by assisting in the development of new programs.

7. ***New Onsite Disposal Systems Management Measure and Operating Onsite Disposal Systems Management Measure***

The two management measures pertaining to OSDS are discussed together because they will be implemented by the same State programs.

- The New Onsite Disposal System management measure is intended to be applied to all new OSDS including package plants and small-scale or regional treatment facilities not covered by NPDES regulations in order to manage the siting, design, installation, and operation and maintenance of all such OSDS. Application of this measure will prevent the installation of conventional OSDS in areas where soil absorption systems will not provide adequate treatment of effluents prior to entry into surface or ground waters.
- The Operating Onsite Disposal Systems management measure is intended to be applied to all operating OSDS. This measure will minimize pollutant loadings from operation OSDS by requiring that they be modified, operated, repaired, and maintained to reduce nutrient and pathogen loadings in order to protect and enhance surface waters.

These management measures will be implemented by the following program:

- RIDEM Division of Groundwater and ISDS Regulations.

Conditions

These management measures are approved with the following conditions:

- Within three years, Rhode Island will develop a strategy to address inspections of existing OSDS and make necessary program changes to address nitrogen-limited surface waters.

8. ***Pollution Prevention Management Measure***

This management measure is intended to be applied to reduce the generation of nonpoint source pollution throughout the section 6217 management area by preventing and reducing pollutant loadings generated from a variety of activities within urban areas not addressed by other management measures in this source category. It is meant to ensure that communities implement solutions that may result in behavioral changes that reduce the generation of pollutants, thus reducing water quality impacts from these sources.

This measure does not require enforceable policies. In Rhode Island, several state agencies and private non-profit groups have programs that currently address the aspects of this measure. For example, Rhode Island recently opened a household hazardous waste collection facility called the Eco-Depot. The revised NSMP has sections that address public education for lawn care and grounds management and the proper disposal of pet excrement. In addition,both municipal and commercial waste recycling programs have also been developed. The Interagency Nonpoint Source Advisory Committee will assume a coordinating role by identifying pollution reduction, prevention and education programs pertaining to this measure.

9. ***Management Measures for Roads, Highways and Bridges***

The six management measures pertaining to roads, highways, and bridges are discussed together because they will be implemented by the same state programs.

- The management measure for Planning, Siting, and Developing is intended to be applied to site development and land disturbing activities for new, relocated, and reconstructed roads and highways in order to reduce the generation of nonpoint source pollutants and to mitigate the impacts of urban runoff from such activities. This measure emphasizes the importance of planning to identify potential problems early in the design process.
- The management measure for Bridges is intended to be applied to new, relocated, and rehabilitated bridge structures in order to control erosion, streambed scouring, and surface runoff from such activities. This will ensure that bridges will not be sited over sensitive waters and tributaries in the coastal zone.
- The management measure for Construction Projects is intended to be applied to new, replaced, restored, and rehabilitated road, highway, and bridge construction projects in order to control erosion and offsite movement of sediment from such project sites. This measure emphasizes the importance of erosion and sediment control plans as effective methods in mitigating erosion problems at construction sites before any land-disturbing activity begins.
- The management measure for Construction Site Chemical Control is intended to be applied to new, resurfaced, restored, and rehabilitated road, highway, and bridge construction

projects in order to reduce toxic and nutrient loadings from such project sites. The objective of this measure is to safeguard surface and ground waters from toxic spills and hazardous loadings at construction sites from equipment and fuel storage, and also from road salt, fertilizers, and pesticides stored at maintenance areas.

- The management measure for Operation and Maintenance is intended to be applied to existing, restored, and rehabilitated roads, highways, and bridges. This measure will ensure that pollutants generated by operation and maintenance procedures for roads, highways, and bridges, and from sparsely vegetated areas, cracked pavements, potholes, and poorly operating urban runoff control structures, are minimized through the development and implementation of a program that includes standard operating procedures and maintenance guidelines.
- The management measure for Road, Highway, and Bridge Runoff Systems is intended to be applied to existing, resurfaced, restored, and rehabilitated roads, highways, and bridges that contribute to adverse impacts to surface waters. Surface waters will be protected through the use of runoff management systems such as vegetated filter strips, grassed swales, detention basins, constructed wetlands, and infiltration trenches.

These six management measures are or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program. The CRMC will implement this measure in accordance with the permit requirements as specified in the Rhode Island Coastal Resources Management Program. The requirements apply to all new and alterations to existing roadways, highways, bridges, parking lots, railroad lines and airports.
- RIDEM, Division of Freshwater Wetlands Rules and Regulations. RIDEM will implement this measure in accordance with requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act.*
- State Acts Relating to Land Use Planning
- *State Guide Plan*

c. **Forestry Nonpoint Pollution Source Category**

Rhode Island has provided sufficient justification to support a categorical exclusion of forestry from the coastal nonpoint program. Section 3.B.2.b of this EA discusses forestry activities in Rhode Island.

The forestry source category was excluded because of the limited extent and low intensity of timber harvesting in Rhode Island, the continued decline in forest ownership by the forest industry, and the continued conversion of small forested areas to urban land use. Cumulative timber removal volumes are low and have been declining over the past 20 years. From 1972 to 1992 Rhode Island's timber harvest volumes dropped 92 percent. In 1992, loggers removed only 130,000 cubic feet of timber overall. Another factor limiting the effects of forestry activities on coastal waters is that very little of the timber that is harvested is cut in the vicinity of coastal towns. During 1990 to 1992, only 14.4 percent of harvested timber was removed from areas adjacent to coastal towns.

Because of the continual decline in timber harvesting in Rhode Island, forestry activities do not, and are not reasonably anticipated to, present significant impacts to coastal waters.

d. **Marinas and Recreational Boating Nonpoint Pollution Source Category**

Because of the extent of recreational boating activities and the large number of marinas in Rhode Island, nonpoint source pollution from these activities poses a threat to coastal waters in certain areas. The 162 marinas, boatyards, and yacht clubs, the 32,000 boats registered with RIDEM's Division of Boater Registration, and the estimated additional 18,000 recreational boats registered with other states that use coastal waters, are an indication of the extent of this source category activity in Rhode Island. Although marinas can be found in almost every coastal town, several communties have a larger percentage of facilities. Warwick, with twenty, has the most marinas. South Kingston and Newport have fifteen facilities, and Westerly has twelve. Rhode Island has a total of 13,043 marina moorings and marina slips, with 21 existing pumpout facilities to service these boats.

Potential nonpoint source problems can be attributed to poor marina siting and design, maintenance dredging, routine marina operation, and boat operations. Pollutants from the operation and maintenance of marinas can also combine with other upland sources such as stormwater runoff and leachate from ISDS to cause significant water quality problems in localized areas. Pollutants such as heavy metals, toxins, hydrocarbons, bacteria, and nutrients can enter coastal waters as a result of marina and boating activities.

According to the Comprehensive Conservation and Management Plan for Narragansett Bay, boaters in the Bay potentially represent a seasonal and local public health risk related to improper treatment and disposal of boater-generated sewage. Boater discharges of floatables (trash, sewage solids), solvents (paints, antifreeze, cleaning agents), and petroleum derivatives (gasoline, oil, grease) also contribute to water quality and habitat degradation. The Plan states that dense assemblages of marinas and mooring fields are responsible for discharge of fecal wastes to the Bay and for seasonal closing of shellfishing areas. For example, RIDEM has closed approximately 115 acres of the coves surrounding Greenwich Bay because of high fecal coliform concentrations in waters adjacent to marinas. In addition, although approximately 28 percent of Narragansett Bay is permanently closed to shellfishing, an additional 769 acres near marinas are closed during summer months because they receive sewage discharges from boats.

The Special Area Management Plan for the Rhode Island Salt Region states that boats and marinas are seasonal sources of bacterial contamination to the Salt Ponds and have been responsible for coliform concentrations elevated above safe shellfishing standards in upper Point Judith Pond and Snug Harbor. Petroleum hydrocarbons, copper from antifouling paint, and creosote from pilings are additional contaminants from marinas and boat operations.

The Rhode Island 305b report (RIDEM, 1992) attributes the change in status from approved to conditionally approved/seasonal of the shellfish growing area in Great Salt Pond to increased boating use. The conditionally approved/seasonal status prohibits shellfishing only during the summer months mainly due to the potential pollution from concentrations of boats with marine toilets during the boating season. This report also lists marinas as probable pollution sources having known or potential impacts on 20 Rhode Island shellfish growing areas including Sakonnet Harbor, Mt. Hope Bay, Point Judith Pond, Greenwich Cove, Newport Harbor, and the Providence, Barrington and Warren Rivers.

Management measures have been developed for the following five subcategories of sources of nonpoint pollution from marinas and recreational boating that affect Rhode Island's coastal waters:

o Poorly flushed waterways where dissolved oxygen deficiencies exist,

- o Pollutants discharged from boats,
- o Pollutants transported in storm water runoff from parking lots, roofs, and other impervious surfaces,
- o The physical alteration or destruction of wetlands and of shellfish and other bottom communities during the construction of marinas, ramps, and related facilities, and
- o Pollutants generated from boat maintenance activities on land and in the water

Fifteen management measures specified for this source category are grouped under two broad headings: (1) siting and design, and (2) operation and maintenance. Effective implementation of these measures will avoid impacts associated with marina siting and prevent the introduction of nonpoint source pollutants.

The six main impacts from the pollutants associated with marina and boating activities that affect water quality include: toxicity in the water column; increased pollutant levels in aquatic organisms; increased pollutant levels in sediments; increased levels of pathogen indicators; disruption of sediment and habitat; and, shoaling and shoreline erosion. The Environmental Consequences section of the PEIS contains an analysis of the impacts of these pollutants on water quality. The management measures are designed to prevent the environmental degradation caused by these pollutants.

The implementation of management measures for marinas and recreational boating will reduce the runoff of pollutants to marina waters and mitigate the impacts associated with the siting and design and the operation and maintenance of new and expanding marinas. Management measures for siting and design will control stormwater runoff from marina parking lots and hull maintenance areas thereby reducing the amount of suspended solids, oil, and grease entering marina waters. The measures will protect wetlands, shellfish beds and submerged aquatic vegetation during marina construction; will provide for water quality assessments to determine whether the marina design will affect water quality; will ensure proper circulation for flushing of the marina basin; and will reduce turbidity and shoaling by protecting against shoreline erosion. The measures for operation and maintenance emphasize the proper disposal of fish and solid wastes and the storage, transfer, containment, and disposal of sewage, oil, antifreeze, solvents, and paints. Restrictions on boating activities in shallow non-marina waters will protect shallow-water habitats and prevent resuspension of sediments and damage to submerged aquatic vegetation.

The environmental benefits that result from the implementation of management measures based on the existing Rhode Island programs and authorities discussed below will be enhanced by finalization of the proposed changes to the marinas section of the RICRMP. These proposed changes will further ensure the implementation of the management measures by developing a clearer link between the operation and maintenance management measures for marinas and the CRMC review and permitting authorities.

Management Measures for Marinas and Recreational Boating

Siting and Design

1. *Marina Flushing Management Measure*

This management measure is intended to be applied to new and expanding marinas. Initial site selection is the most important factor influencing the long-term impact a marina will have on water quality within the immediate vicinity of the marina.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program (RICRMP). The CRMC will implement this measure under three separate provisions of the RICRMP pertaining to: (1) Water Type policies which pre-identify appropriate locations for consideration for marina locations; (2) review of applications for all new marinas and significant in-water expansions of marinas to ensure that the activity will not have significant impacts on the environment; and (3) amending the existing standards for marina construction.
- CRMC Municipal Harbor Management Program. This program will implement the measure with respect to the siting and design of new public mooring areas or the significant expansions of existing public mooring areas.
- RIDEM, Division of Water Resources. This measure will be implemented in accordance with Water Quality Regulations for Water Pollution Control. The Water Quality Regulations set specific criteria for all surface waters.

2. *Water Quality Assessment Management Measure*

This management measure is intended to be applied to new and expanding marinas. Water quality assessments such as modeling of flushing rates, measuring water quality characteristics, and monitoring may be used to determine whether a proposed marina design will adversely affect water quality.

(See discussion for marina flushing management measure for programs implementing this measure).

3. *Habitat Assessment Management Measure*

This management measure is intended to be applied to new and expanding marinas where site changes may impact on wetlands, shellfish beds, submerged aquatic vegetation, or other important habitats. Proper siting and design can reduce short-term impacts (habitat destruction during construction) and long-term impacts (water quality, sedimentation, circulation) on the surrounding environment.

(See discussion for marina flushing management measure for programs implementing this measure).

4. *Shoreline Stabilization Management Measure*

This management measure is intended to be applied to new and expanding marinas where site changes may result in shoreline erosion. This measure has been shown to be effective in mitigating shoreline erosion and the resulting turbidity and shoaling.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program (RICRMP). The CRMC will implement this measure under three provisions of the RICRMP pertaining to: (1) Water Types

and Coastal Features policies which specify where structural shoreline protection is and is not allowed; (2) policies and standards for constructing structural shoreline protection facilities; and (3) review of applications for new and expanding marinas to ensure that the activity will not result in erosion and/or deposition along the shore or in tidal waters.

- RIDEM, Division of Water Resources, Water Quality Regulations. The water quality review for marinas will require that methods be employed to minimize/prevent shoreline erosion.

5. *Storm Water Runoff Management Measure*

This management measure is intended to be applied to new and expanding marinas, and to existing marinas for at least the hull maintenance areas. Pollutants can be controlled through three techniques: filtration/infiltration; retention/detention; and, physical separation.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program (RICRMP). The CRMC will implement this measure under three provisions of the RICRMP pertaining to: (1) treatment of sewage and stormwater so as to reduce the average annual total suspended solids loadings; (2) proposed regulations for marinas to implement effective runoff control strategies; and, (3) require that marinas treat their stormwater and prepare stormwater management plans in a manner consistent with the Rhode Island Stormwater Design and Installation Standards Manual.
- RIDEM, Division of Water Resources, Water Quality Regulations.

(See discussion for marina flushing management measure).

6. *Fueling Station Design Management Measure*

This management measure is intended to be applied to new and expanding marinas where fueling stations are to be added or moved. Marinas should be located and designed and a spill contingency plan developed so that pollutants released during fueling operations can be contained in a limited area to minimize spread through and out of the marina.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resource Management Program (RICRMP). The CRMC will implement this measure under two provisions of the RICRMP pertaining to: (1) proposed amendments containing standards for marina operators to design fueling stations to allow for ease in cleanup of spills; and, (2) a marina best management practices (BMP's) manual which specifies appropriate BMP's applicable to fueling stations.
- RIDEM, Division of Water Resources, Water Quality Regulations.

(See discussion for marina flushing management measure).

7. *Sewage Facility Management Measure*

This management measure is intended to be applied to new and expanding marinas in areas where adequate marine sewage collection facilities do not exist. The availability and use of these systems will reduce discharges of sanitary wastes to coastal waters.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resource Management Program (RICRMP). The CRMC will implement this measure under two provisions of the RICRMP pertaining to: (1) proposed amendments to an existing section requiring new marinas and any expansion of existing marinas that results in greater than or equal to 50 new slips to install a pumpout facility; and, (2) a marina best management practices (BMP's) manual developed by the University of Rhode Island Coastal Resources Center which specifies appropriate BMP's applicable to pumpout stations.
- RIDEM, Division of Water Resources, Water Quality Regulations. This measure will be implemented through the requirement that marina operators installing pumpout facilities using federal Clean Vessel Act funds must have an operation and maintenance plan as a condition for getting the required RIDEM Order of Approval.

Operation and Maintenance

1. *Solid Waste Management Measure and Fish Waste Management Measure*

The two management measures pertaining to solid waste and fish waste management are discussed together because they will be implemented by the same programs.

- The Solid Waste Management Measure is intended to be applied to new and expanding marinas. If adequate disposal facilities are available there is less likelihood for disposal of solid waste in surface waters or on shore where the material may wash into the waters.
- The Fish Waste management measure is intended to be applied to marinas where fish waste is determined to be a source of water pollution. Marina patrons and employees are more likely to properly dispose of fish waste if told of potential environmental effects and provided adequate and convenient disposal facilities.

These management measures are or will be implemented by the following State programs:

- Rhode Island Coastal Resource Management Program (RICRMP). The CRMC will implement this measure under two provisions of the RICRMP pertaining to: (1) proposed operation and maintenance program requirements that will require marinas to develop and implement comprehensive marina operation and maintenance programs which will address a series of potential nonpoint sources, including solid wastes; and, (2) a best management practices manual for operation and maintenance activities.
- RIDEM, Division of Water Resources, Water Quality Regulations. This measure will be implemented through the requirement to assess all aspects of the projects and its impacts on water quality prior to issuing a water quality certification.

2. *Liquid Material Management Measure*

This management measure is intended to be applied to marinas where liquid materials used in the maintenance, repair, or operation of boats are stored. This measure minimizes

entry of potentially harmful liquid materials into marina and surface waters through proper storage and disposal.

In addition to the programs listed above for Solid Waste and Fish Waste management measures, this management measure is or will also be implemented by the following program:

- RIDEM, Office of Environmental Coordination. This measure will be implemented through a recycling program for household hazardous wastes.

3. ***Petroleum Control Management Measure***

This management measure is intended to be applied to boats that have inboard fuel tanks. The amount of fuel and oil entering marina and surface waters can be reduced by using devices such as automatic shut-off nozzles, fuel/air separators, and oil-absorbing bilge pads.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resource Management Program (RICRMP). The CRMC will implement this measure under two provisions of the RICRMP pertaining to: (1) proposed amendments that will require marinas to develop and implement comprehensive marina operation and maintenance programs which will address a series of potential nonpoint sources, including petroleum; and, (2) a best management practices manual for operation and maintenance activities.
- RIDEM, Division of Water Resources, Water Quality Regulations. (See discussion for solid waste management measures).

4. ***Boat Cleaning Management Measure***

This management measure is intended to be applied to marinas where boat topsides are cleaned and marinas where hull scrubbing in the water has been shown to result in water quality problems. This measure minimizes the use and release of potentially harmful cleaners and bottom paints to marina and surface waters.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resource Management Program (RICRMP). The CRMC will implement this measure under two provisions of the RICRMP pertaining to: (1) proposed amendments that will require marinas to develop and implement comprehensive marina operation and maintenance programs which will address a series of potential nonpoint sources, including boat cleaning; and, (2) a best management practices manual for operation and maintenance activities.
- CRMC Municipal Harbor Management Program. This program will implement the measure with respect to public mooring areas and the requirement for CRMC's approval of harbor management plans and ordinances.
- RIDEM, Division of Water Resources, Water Quality Regulations. (See discussion for solid waste management measures).

5. ***Public Education Management Measure***

This management measure is intended to be applied to all environmental control authorities in areas where marinas are located. The best method of preventing pollution from

marinas and boating activities is to educate the public about the causes and effects of pollution and methods to prevent it.

This management measure is or will be implemented by the following programs:

- CRMC Municipal Harbor Management Program. This program will work on an on-going basis to ensure that adequate opportunities exist with respect to public outreach/education/training to boat owners and marina operators.

6. *Maintenance of Sewage Facilities Management Measure*

This management measure is intended to be applied to marinas where marine sewage disposal facilities exist. This measure is effective in preventing failure of pumpouts and discourages improper disposal of sanitary wastes thus reducing the release of untreated sewage into marina and surface waters.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resource Management Program (RICRMP). The CRMC will implement this measure under two provisions of the RICRMP pertaining to: (1) proposed amendments that will require marinas to develop and implement comprehensive marina operation and maintenance programs which will address a series of potential nonpoint sources, including sewage pumpout facilities; and, (2) a best management practices manual for operation and maintenance activities.
- RIDEM, Division of Water Resources, Water Quality Regulations. This program requires marinas to operate and maintain sewage pumpout facilities in strict conformance with the conditions contained in RIDEM's Order of Approval.

7. Boat Operation Management Measure (applies to boating only)

This management measure is intended to be applied in non-marina surface waters where evidence indicates that boating activities are impacting shallow-water habitats. Boat operation in shallow water can resuspend bottom sediment, increase turbidity, and damage submerged aquatic vegetation. This management measure will minimize damage to sensitive habitats by excluding boats from shallow-water areas not suitable for boat traffic because of their ecological importance. Establishing no-wake zones will minimize the indirect impacts of increased turbidity.

This management measure is or will be implemented by the following programs:

- CRMC Municipal Harbor Management Program. This program will implement the measure through proposed amendments that will require all municipal harbor management plans to ensure that boating activities are restricted where necessary to decrease turbitity and phyical destruction of shallow-water habitat.
- RIDEM, Division of Water Resources, Water Quality Regulations. A water quality certification review assesses all the potential impacts of activities on water quality criteria, including turbidity caused by boat operations.

e. **Hydromodification Nonpoint Pollution Source Category**

The only channelization and channel modification activity that occurs in Rhode Island is dredging for navigational purposes. The descriptions of implementation of the channelization management measures therefore focuses on dredging activities.

Dredging activity in Rhode Island is low, intermittent, and limited to tidal waters. Dredging involves both improvement dredging to increase the depth or extent of channels, and maintenance dredging to remove material that has settled back into previously dredged areas. Dredging activities in recent years have been limited and of the maintenance type. CRMC permitting records indicate that only 13 applications for dredging activities were approved and completed between 1988 and 1994. These projects were completed at Newport, South Kingstown, Warren, North Kingston, New Shoreham, Westerly, Portsmouth, and Warwick. The total dredge material resulting from these projects was only 35,612 cubic yards. However, the Army Corps of Engineers is currently in the process of developing plans to dredge Providence Harbor. Although the limited amount of dredging in recent years has reduced the amount of nonpoint source pollution from these activities, potential future dredging activities make implementation of the management measures necessary.

According to RIDEM, there are 506 dams situated in Rhode Island waters. However, only 157 of these dams meet the following 6217(g) definition for dams:

- Constructed impoundments 25 feet or more in height and greater than 15 acre-feet in capacity, or;
- Constructed impoundments 6 feet or more in height and greater than 50 acre-feet in capacity.

Approximately 19 of the 157 dams are 25 feet or more in height and possess storages greater than 15 acre-feet. Only 16 dams are capable of functioning as hydroelectric generation facilities; only six of these are in operation. The other dams are just permanent fixtures remaining from the Industrial Revolution and serve no useful purpose.

Most significant shoreline erosion in Rhode Island occurs as a result of severe storms or the natural erosional processes which impact barrier beaches. Natural erosion in coastal bays, rivers, and creeks has not been identified as a nonpoint problem in Rhode Island. Human alterations such as the construction of structural shoreline protection facilities also affect natural erosional processes. All critical erosional areas for coastal waters have been mapped and are contained in the RICRMP.

Although the extent of activities and production of pollutants within the hydromodification source category in Rhode Island is minimal, the implementation of management measures will reduce the impacts associated with present activities and ensure that future activities, such as the planned dredging of Providence Harbor, are conducted without causing adverse environmental impacts.

Management measures have been developed for the following three subcategories of sources of nonpoint pollution from hydromodification activities that affect Rhode Island's coastal waters:

- o Channelization and channel modification
- o Dams
- o Streambank and shoreline erosion

The main effects of the pollutants associated with hydromodification activities that affect water quality include: changed sediment supply, reduced availability of fresh water, accelerated delivery of pollutants, loss of surface water contact with overbank areas, loss or alteration of wetlands and instream and riparian habitats, blocked or impeded migration routes of fish, and increased sediment and nutrient levels. The Environmental Consequences section

of the PEIS contains an analysis of the impacts of these pollutants on water quality. The management measures are designed to prevent the environmental degradation caused by these pollutants.

The implementation of management measures for hydromodification activities are intended to prevent degradation of the physical and chemical characteristics of surface waters and detrimental changes to instream and riparian habitat resulting from the transport of pollutants and from alterations in the supply of sediment and freshwater. The measures will minimize erosion, control sediment runoff, prevent downstream contamination from pesticides, petrochemicals, fertilizers, lime, cement, and construction chemicals, and protect the quality of water and aquatic habitat in reservoirs. The measures will also protect eroding streambank and shorelines that constitute a nonpoint pollution source that contributes to increased turbidity and nutrient levels in coastal waters.

The environmental benefits that result from the implementation of management measures for hydromodification activities using the existing programs and authorities discussed below will be enhanced by the amendments Rhode Island is proposing to make to the RICRMP. The first amendment will further strengthen implementation of management measures by requiring applicants for new channelization projects to demonstrate that the intent of the two channelization measures has been met. The second amendment will incorporate the specific wording of the dams management measures into the RICRMP.

Management Measures for Hydromodification

The Rhode Island program submittal adequately addresses the first two elements of the channelization and channel modification management measures and most of the elements of the dams management measure for the protection of surface water quality and instream and riparian habitat. These management measures are approved with the following conditions:

- Within three years, Rhode Island will develop a process to identify opportunities and, where appropriate, implement practices to improve the physical and chemical characteristics of surface waters and instream and riparian habitats in existing channels and protect surface water quality and instream riparian habitat at existing dams.

Channelization and Channel Modification

1. *Management Measure for Physical and Chemical Characteristics of Surface Waters*

This management measure is intended to be applied to public and private channelization and channel modification activities in order to prevent the degradation of physical and chemical characteristics of surface waters from such activities. The purpose of this management measure is to ensure that the planning process for new hydromodification projects

addresses changes to physical and chemical characteristics of surface waters that may occur as a result of the proposed work.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program (RICRMP). CRMC will

implement this measure in accordance with the permit requirements specified in the RICRMP and its proposed amendments pertaining to planning, design, operation, and maintenance programs for channelization and channel modification activities. Channelization activities must be planned and designed in a manner which does not cause significant adverse impacts to the physical and chemical characteristics of surface waters.

- RIDEM, Division of Freshwater Wetlands. This measure will be implemented through Freshwater Wetlands Regulations that pertain to any activities that could alter the character of a freshwater wetland and contiguous areas.

2. ***Instream and Riparian Habitat Restoration Management Measure***

This management measure pertains to surface waters where channelization and channel modification have altered or have the potential to alter instream and riparian habitat such that historically present fish or wildlife are adversely affected. The purpose of this management measure is to correct or prevent detrimental changes to instream and riparian habitat from the impacts of channelization and channel modification projects.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program (RICRMP). CRMC will implement this measure in accordance with the permit requirements specified in the RICRMP and its proposed amendments. Channelization activities must be planned and designed in a manner which does not cause significant adverse impacts to instream and riparian habitats. Best management practices must also be used to protect habitats.
- RIDEM, Division of Freshwater Wetlands. (See discussion above for physical and chemical characteristics management measure).

Dams

1. ***Management Measure for Erosion and Sediment Control***

This management measure is intended to be applied to the construction of new dams, as well as to construction activities associated with the maintenance of dams. The purpose of this measure is to prevent sediment from entering surface waters by minimizing erosion and maximizing sediment retention onsite to reduce impacts on surface water quality.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program (RICRMP). CRMC will implement this measure in accordance with the permit requirements specified in the RICRMP and its proposed amendments. An erosion and sediment control plan which demonstrates that erosion shall be reduced and retained onsite during and after construction is required for any construction activities associated with dams.
- RIDEM, Division of Freshwater Wetlands. Under the Inspection of Dams and

Reservoirs Act no dam may be constructed or substantially altered until plans and specifications of the proposed work have been filed and approved by RIDEM.

2. ***Management Measure for Chemical and Pollutant Control***

This management measure is intended to be applied to the construction of new dams, as well as to construction activities associated with the maintenance of dams. The purpose of this measure is to prevent downstream contamination from pollutants such as pesticides, petrochemicals, fertilizers, lime, cement, and construction chemicals. This measure will provide for retention onsite of the soluble pollutants that are not easily controlled by erosion and sediment control practices.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program (RICRMP). CRMC will implement this measure in accordance with the permit requirements specified in the RICRMP and its proposed amendments. This program requires an erosion and sediment control plan that addresses the application, storage, and disposal of chemicals for any construction activity associated with dams.
- RIDEM, Division of Freshwater Wetlands Rules and Regulations. This measure will be implemented by the requirement that any application to alter a freshwater wetland must describe all best management practices and technologies which will be employed to avoid impacts to freshwater wetlands.

3. ***Management Measure for Protection of Surface Water Quality and Instream and Riparian Habitat***

This management measure is intended to be applied to dam operations that could result in the loss of desirable surface water quality, and of desirable instream and riparian habitat. The purpose of this measure is to protect the quality of surface waters and aquatic habitat in reservoirs and in the downstream portions of rivers and streams that are influenced by the quality of water contained in the releases (tailwaters) from reservoir impoundments.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program (RICRMP). CRMC will implement this measure in accordance with the permit requirements specified in the RICRMP and its proposed amendments. This program requires applicants proposing to alter the volume of freshwater discharged to estuarine waters to demonstrate appropriate practices to mitigate impacts to surface water quality and instream riparian habitats.
- RIDEM, Division of Freshwater Wetlands Rules and Regulations. This program requires applicants proposing to alter the volume of freshwater discharges to identify and describe water quality impacts associated with increasing pollutant sources.

Streambank and Shoreline Erosion

1. ***Management Measure for Eroding Streambanks and Shorelines***

This management measure is intended to be applied to eroding shorelines in coastal bays, and to eroding streambanks in coastal rivers and creeks. This measure applies only to eroding shorelines and streambanks that constitute a nonpoint source pollution problem in surface waters. The application of vegetative or engineering stabilization techniques are effective in controlling coastal erosion. These techniques also serve to halt the destruction of wetlands and riparian areas.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program (RICRMP). CRMC policies promote the use of nonstructural methods of shoreline protection and prohibit structural methods on all barrier beaches and on coastal features adjacent to Type 1 waters.
- RIDEM, Division of Freshwater Wetlands Rules and Regulations. This program regulates all projects that may alter freshwater wetlands and will deny a permit if a proposed project would result in an undesireable alteration of a wetland.

f. **Wetlands, Riparian Areas, and Vegetated Treatment Systems**

Much of the original extent of coastal and freshwater wetlands in Rhode Island have been altered by filling with materials dredged during urban expansion and port and harbor development. However, since the adoption of the RICRMP in 1976, all tidal wetlands and contiguous wetlands are protected regardless of size, and any filling or alteration is prohibited in approximately 90% of the state's remaining salt marshes. The last dumping of dredged material on a Rhode Island salt marsh occurred in 1963. According to the National Wetlands Inventory of 1989, Rhode Island contains approximately 7,949 acres of coastal wetlands (931 acres of marine wetlands and 7,018 acres of estuarine wetlands) and 57,106 acres of freshwater wetlands.

The shoreline of Narragansett Bay has been altered by the addition of millions of cubic yards of dredged materials to the salt marshes and the low-lying shorelines along its length. Materials dredged from the shipping channel were used to fill the marshes along the Providence River to create more pier and berthing areas for the port. Downtown Providence, Newport, and many other low-lying coastal communities are built on what was once coastal wetlands.

When hydrologic changes or pollutants exceed the natural assimilative capacity of wetlands and riparian areas, the systems become stressed and may be degraded or destroyed to the point that the wetlands and riparian areas themselves become sources of nonpoint pollution in coastal waters. A degraded wetland has less ability to remove pollutants and can deliver increased amounts of sediment, nutrients, and other pollutants to the adjoining waterbody.

Management measures for wetlands, riparian areas, and vegetated treatment systems address multiple categories of nonpoint source pollution that affect coastal waters, including the five specific categories of sources previously addressed in this chapter. These measures promote the protection and restoration of wetlands and riparian areas and the use of vegetated treatment systems as means to control the nonpoint pollution emanating from such sources. Management measures are provided for three categories:

- o Protection of wetlands and riparian areas
- o Restoration of wetlands and riparian areas

o Promoting the use of vegetated treatment systems, such as constructed wetlands and vegetated filter strips

The Environmental Consequences section of the PEIS contains a discussion of the functions and importance of wetlands, riparian areas, vegetated buffers, and vegetated treatment systems.

The intent of the management measures for wetlands, riparian areas and vegetated treatment systems is to ensure that the nonpoint benefits of protecting and restoring wetlands and riparian areas, and of constructing vegetated treatment systems, will be considered in all coastal watershed water pollution control activities. The implementation of managment measures will protect and restore the full range of functions for wetlands and riparian areas serving a nonpoint source abatement function and ensure that they do not become a significant nonpoint source due to degradation.

The environmental benefits that result from the implementation of management measures for wetlands, riparian areas, and vegetated treatment systems using the existing programs and authorities discussed below will be enhanced by the amendments Rhode Island is proposing to make to the RICRMP. These amendments will further strengthen implementation of the management measures by revising the RICRMP to apply to all alterations of coastal wetlands within jurisdiction of the CRMC. Amending the RICRMP to include a new policy which will incorporate the specific wording of the wetlands and riparian management measures will strengthen CRMC's ability to protect, manage, regulate, and restore coastal wetlands serving a nonpoint source abatement function.

Management Measures for Wetlands, Riparian Areas and Vegetated Treatment Systems

1. *Management Measure for Protection of Wetlands and Riparian Areas*

This management measure is intended to be applied to protect wetlands and riparian areas from adverse nonpoint source pollution impacts. The purpose is to protect the existing water quality improvement functions of wetlands and riparian areas as a component of nonpoint source programs. The overall approach is to establish a set of practices that maintains functions of wetlands and riparian areas and prevents adverse impacts to areas serving a nonpoint source pollution abatement function. These pollution abatement functions are most effective as parts of an integrated land management system that combines nutrient, sediment, and soil erosion control.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program (RICRMP). This program contains setback and buffer zone requirements, Special Area Management Plans, and wetlands mitigation policies to help protect wetlands and riparian areas.
- RIDEM, Division of Freshwater Wetlands Program. This program enforces the Freshwater Wetlands Act which establishes and defines the permit and enforcement mechanisms used to protect all functions and values of freshwater wetlands.

<u>Conditions:</u>

This management measure is approved with the following conditions:

- Within three years, Rhode Island will develop a process to identify opportunities and, where appropriate, implement practices to protect existing wetlands and riparian areas that are not being actively altered but that serve a significant nonpoint source abatement function.

2. ***Management Measure for Restoration of Wetland and Riparian Areas***

This management measure is intended to be applied to restore the full range of wetlands and riparian functions in areas where the systems have been degraded and destroyed and where they can serve a significant nonpoint source abatement function. This management measure should be used in conjunction with other measures addressing the adjacent land and water use activities in order to protect coastal water quality.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program (RICRMP). This program contains setback and buffer zone requirements, Special Area Management Plans, and wetlands mitigation policies to help protect wetlands and riparian areas.
- RIDEM, Division of Freshwater Wetlands Program. (See discussion on protection of wetlands above).

3. ***Management Measure for Vegetated Treatment Systems***

This management measure is intended to be applied in cases where engineered systems of wetlands or vegetated treatment systems can treat nonpoint source pollution. Constructed wetlands and vegetated filter strips can serve a significant nonpoint source pollution abatement function. Vegetated filter strips can improve water quality by removing nutrients, sediment, suspended solids, and pesticides. Constructed wetlands can provide limited ecological benefits in addition to their nonpoint source control functions.

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program (RICRMP). This measure is implemented by enforceable requirements for establishing coastal buffer zones adjacent to coastal features to act as a natural transition zones between the coast and adjacent upland development.
- RIDEM, Division of Freshwater Wetlands Program. This program will implement the measure through promotional guidance materials that promote vegetative treatment systems where they can serve a significant nonpoint source pollution abatement function.

ENVIRONMENTAL CONSEQUENCES

4.A MANAGEMENT MEASURES IMPLEMENTATION, continued

2. SOCIOECONOMIC IMPACTS

a. Section 4.A.2 of the PEIS provides a summary of the economic implications of the management measures guidance as described in the Regulatory Impact Analysis prepared by EPA (EPA, 1992c). The section also summarizes the economic achievability analyses performed for all nonpoint source categories (USEPA, 1992b; Ogg, 1992; DPRA, 1992; Research Triangle Institute, 1992a, 1992b, 1992c). These analyses provided a relative sense of the economic impacts of the management measures on affected households, municipalities, and commercial enterprises. EPA determined from these studies that all the management measures specified in its guidance document are economically achievable.

In developing the (g) guidance document, EPA adopted a flexible approach that emphasized broad principles or standards for nonpoint source pollution control that can be applied nationally. This allows states to develop more specific programs that reflect the most cost-effective approaches in response to local conditions.

While the implementation of management measures will entail some economic costs to Rhode Island, the flexibility embodied in the (g) guidance and in the NOAA/EPA Program Development and Approval Guidance document will help to reduce the economic impacts associated with implementing the coastal nonpoint program. For example, Rhode Island will have until the year 2004 to fully implement the (g) management measures and until 2009 to fully implement the coastal nonpoint program, including additional management measures where necessary. This ability to phase in program implementation over several years allows economic impacts to be absorbed over a longer time period. Another aspect of the flexibility in the program is that states may also exclude categories, subcategories, or individual nonpoint sources where the sources do not exist or are not anticipated to exist, or do not present a threat to coastal waters. This allows states to adapt their programs to local conditions thus implementing their programs in a more cost effective manner. Based on this flexibility, Rhode Island proposed, and NOAA and EPA approved, exclusions for the forestry source category and for the agricultural source category, except for exclusion of measures for confined animal facilities and certain aspects of the nutrient management measure.

States may also adopt voluntary, education, and market-based incentive systems in addition to regulatory programs as a means of management measure implementation. Rhode Island has existing programs that implement the urban pollution prevention management measure through prevention and education programs. For example, to ensure proper disposal of household hazardous waste, including automobile fluids, pesticides, and paints, Rhode Island has opened a household hazardous waste collection facility called the Eco-Depot. In addition, to prevent lawn and garden activities from generating nonpoint pollutants, the revised Nonpoint Source Management Plan includes a section, entitled "Lawn Care and Grounds Management." This section of the plan contains six recommendations that promote public education, technical training programs for grounds managers, and the development and distribution of guidance materials.

b. The implementation of management measures will also produce positive socioeconomic benefits for Rhode Island. For example, since many of Rhode Island's coastal water quality problems are linked to urban sources of pollutants, the urban management measures will help to reduce urban nonpoint sources such as sediment from construction sites, stormwater runoff from highways and developed areas, and leachate from septic systems. In addition, because of the large number of recreational boaters and marinas in Rhode Island, nonpoint pollution from marinas can be expected to adversely affect coastal resources in

certain areas. Management measures that result in improved marina siting and design along with the implementation of best management practices for marina operation and maintenance can reduce impacts associated with this nonpoint source. Implementation of management measures will improve water quality, enhance recreational opportunities, increase property values, provide ground water protection, benefit commercial fisheries, and reduce the risk to human health from water contact activities and consumption of shellfish. Improved water quality will increase the aesthetic value of coastal areas and thus benefit tourism.

4.B PROGRAM IMPLEMENTATION

1. ENVIRONMENTAL IMPACTS

Section 6217 requires that state and territory coastal nonpoint programs contain a number of specific components to be used in developing and implementing their programs. These components are:

- o Coordination with Existing State Programs
- o Determination of the 6217 Management area
- o Implementation of Management Measures in Conformity with (g) Guidance
- o Identification and Implementation of Additional Management Measures
- o Technical Assistance
- o Public Participation
- o Administrative Coordination
- o Identification of Enforceable Policies and Mechanisms

The environmental consequences of these components are discussed below.

a. Coordination with Existing State Programs

The statute requires that coastal nonpoint programs be closely coordinated with state and local water quality plans and programs and with state coastal zone management programs. This requirement is necessary to ensure that the new coastal nonpoint program can build upon and be integrated into existing state programs upon approval. States should develop their programs to complement and strengthen existing coastal management and nonpoint source authorities. This should produce a positive environmental consequence by minimizing unnecessary duplication or conflicts at the Federal, state, or local levels. It will also fulfill what the statute and legislative history indicate is the central purpose of section 6217, i.e., to strengthen the links between Federal and state coastal zone management and water quality programs in order to enhance state and local efforts to manage land use activities that degrade coastal waters.

The Rhode Island coastal nonpoint program will be administered through two existing state regulatory agencies and their associated programs: the Coastal Resources Management Council (CRMC) and the Rhode Island Department of Environmental Management (RIDEM). In addition to these agencies, the state will rely upon the Municipal Comprehensive Planning Program, state enabling acts related to land use planning, and the State Guide Plan.

The Rhode Island coastal zone management program is administered through the CRMC. The CRMC was created for the purpose of managing the coastal resources of the state. The CRMC adopted the Rhode Island Coastal Resources Management Program (RICRMP) and received Federal program approval pursuant to the Coastal Zone Management Act in 1978. The RICRMP is structured as a coastal zoning program and is regulatory in nature. It has

specific policies and prohibitions pertaining to specific water and shoreline type designations, and to certain types of activities, such as recreational boating facilities. The CRMC is authorized to approve, modify, set conditions for, or reject the design, location, construction, alteration, and operation of specified activities under the Council's jurisdiction.

The Rhode Island nonpoint source program developed pursuant to section 319 of the Clean Water Act is included in the Rhode Island Nonpoint Source Management Plan (RINSMP). It is administered by the RIDEM Office of Environmental Coordination. A revised RINSMP is currently being developed and will become an element of the State Guide Plan. Section 319 requires a management program which provides an assessment of the extent of nonpoint pollution and a management plan that specifies and implements nonpoint source controls.

As noted above, portions of the coastal nonpoint program will rely on the Rhode Island Comprehensive Planning and Land Use Regulation Act, enabling acts related to land use planning, and the State Guide Plan. These are implemented by the Rhode Island Department of Administration and together are viewed as a single, integrated approach to state oversight over land and water uses.

b. 6217 Management Area

As directed by section 6217, NOAA, in consultation with EPA, reviewed each state's existing coastal zone boundary established under the CZMA, and made recommendations to the states on the geographic scope of their programs, i.e., the 6217 management area. This boundary recommendation, which was based on coastal watersheds, is a guide for states to use during program development. States may propose an alternative 6217 management area at the time of program submission. This proposal will then be evaluated by NOAA and EPA as part of the program review and approval process.

This provision has a positive environmental effect because it recognizes that land and water uses both within and outside of the existing coastal zone have the potential to degrade coastal waters. Evaluating coastal watersheds, whether or not those watersheds are completely encompassed within a state's existing coastal zone, ensures that all potential sources of nonpoint pollution that significantly affect coastal waters are included in the coastal nonpoint programs.

NOAA recommended that the Rhode Island 6217 management area should encompass the entire state. Rhode Island has chosen not to propose an alternative management area, therefore the nonpoint program will be implemented statewide and will encompass all nonpoint sources within the state which can impact the state's coastal waters.

c. Implementation of Management Measures in Conformity with (g) Guidance

For program approval, each coastal nonpoint program must provide for the implementation, at a minimum, of management measures in conformity with the guidance published by EPA under section 6217(g). As discussed in section 4.A, this guidance addresses five categories of nonpoint pollution: agricultural runoff, urban runoff, forestry runoff, marinas, and hydromodification. Guidance is also provided for wetlands, riparian areas, and vegetated filter strips. The environmental consequences of implementing each of these management measures is discussed above in section 4.A.1. In order to satisfy statutory requirements, state programs must identify the nonpoint source categories that will be addressed; management measures for those categories; and the process by which the state will

ensure the implementation of the management measures. Each coastal nonpoint program must address each of the management measures by either implementing that measure (or an equally effective alternative), or justifying why the management measure is not included in the program.

The requirement that states implement the appropriate measures should have a positive environmental effect because the management measures are designed to reduce pollution from categories and sources of nonpoint pollution that can adversely impact a state's coastal waters. In addition, a state may include management measures for sources not identified in the 6217(g) guidance, if it determines such measures are necessary to protect coastal waters.

Rhode Island requested and NOAA and EPA approved exclusions for the forestry source category and for the agriculture source category, except for exclusions for confined animal facilities and certain aspects of the nutrient management measure. The forestry category was entirely excluded because the activities covered by that category do not and are not reasonably expected to, individually or cumulatively, present significant adverse effects to living coastal resources or human health in Rhode Island. The agricultural category was excluded with the exception of management measures for Facility Wastewater and Runoff from Confined Animal Facilities (large and small units) and the portions of the nutrient management measure that addresses application of animal waste. The Rhode Island program provides for implementation of management measures in conformity with (g) guidance for urban runoff, marinas, hydromodifications, and wetlands, riparian areas, and vegetated treatment systems.

d. Requirements for Implementation of Additional Management Measures

For program approval, coastal nonpoint programs must provide for the implementation of additional management measures where coastal water quality is impaired or threatened even after the implementation of the management measures specified in the (g) guidance. These additional management measures are to be applied both to existing land and water uses that are found to cause or contribute to water quality impairment and to new or substantially expanding land uses within critical coastal areas adjacent to impaired or threatened coastal waters.

This requirement should have a beneficial environmental effect because it will provide a second tier of protection where necessary to attain and maintain water quality standards and protect critical areas against future pollution problems.

Rhode Island has identified several programs and related requirements which meet the criteria for additional management measures. For example, the revised Rhode Island Nonpoint Source Management Plan contains a priority watersheds selection system that sets out an ongoing process for the coordinated targeting of future watershed management efforts to threatened and impaired waters. These efforts meet the criteria for additional management measures since they often result in controls that exceed (g) guidance requirements. CRMC's 200-foot permit jurisdiction also meets the intent of critical coastal area. Within this area, all development activities are subject to special controls such as setbacks, buffers, and stormwater management. However, Rhode Island proposes implementation of the (g) measures and the completion of existing programs (such as the implementation of the revised Rhode Island Nonpoint Source Management Plan and the revision of the CRMC's Special Area Management Plans for the Salt Pond and Narrow River regions) which will complement and influence the implementation of additional management measures prior to development of any new regulatory approaches or the identification of new critical coastal areas.

e. Technical Assistance

For program approval, coastal nonpoint programs are required to provide for technical and other assistance to local governments and the public for implementing the additional management measures. States are also encouraged to provide assistance to local governments and the public for the implementation of the (g) guidance measures. Assistance may be provided in developing ordinances and regulations, technical guidance, training, financial incentives, or demonstration projects.

This requirement will be environmentally beneficial because the technical assistance will enable the management measures to be better implemented at the regional or local level. The assistance will address local needs with respect to implementation and will provide a better understanding of what the measures are trying to accomplish and how to best accomplish it. EPA has assembled a great deal of technical information during the development of its guidance document. This information will be available to the states in a variety of formats, including bibliographies and summaries, and by electronic bulletin boards.

The Rhode Island nonpoint pollution program lists 14 technical assistance programs that will be used to assist municipalities and the general public with implementation of additional management measures. For example, the Nonpoint Source Pollution Management Plan includes recommendations relating to technical assistance to municipalities and the public under 16 separate categories, including on-site sewage disposal systems, surface runoff, underground discharges, construction activities, agriculture, lawn care, silviculture, storage tanks, hazardous materials, road and bridge maintenance, boating facilities, surface mining activities, domestic and wild animals, landfills, land use management, and watershed management. The types of assistance projects recommended in the Plan relate to assistance in developing ordinances and regulations, assistance with site plan reviews, training, public education and outreach, and technology transfer.

Other sources of technical assistance include the Coastal Resources Management Council which provides assistance to municipalities in developing Harbor Management Plans and ordinances to address problems including water quality and marine litter. The University of Rhode Island Cooperative Extension provides training to planners, regulators, engineers, and contractors on the design, installation, operation, and maintenance of alternative OSDS technologies. The University's Coastal Resources Center conducts public education, outreach, and training programs for marina operators.

f. Public Participation

For program approval, states must provide opportunities for public participation in all aspects of the coastal nonpoint program. Congress intended that the public be involved in the development and implementation of the program, calling not only for public participation, but also for public education.

Involving the public early in the development of the program should help improve acceptance of the program and promote and maintain the public's long-term commitment to support the goals of section 6217. Specifically providing opportunities for public comment, especially by those regulated or affected by the program, prior to program development and implementation can ensure that the program will be accepted, and therefore more effective in controlling nonpoint pollution. The public education aspect of the requirement will be beneficial by making individuals more aware of the impact of their actions on coastal waters and by generating support for pollution control efforts at the state and local level.

Rhode Island's public participation activities began in 1993 when CRMC, RIDEM and other state agencies sponsored a statewide conference and an interagency workshop. Both meetings focused on nonpoint pollution and the creation of an advisory committee which would be used to develop the 6217 program and revise the Rhode Island Nonpoint Source Management Plan. An Interagency Nonpoint Source Advisory Committee was created to coordinate the efforts of the technical advisory subcommittees formed to develop the actual nonpoint programs. The subcommittees were composed of federal, state, and local officials and members of nongovernmental organizations and the general public. A Public Outreach and Technical Assistance Subcommittee was established to:

- Coordinate the distribution of existing nonpoint source outreach and technical assistance materials;
- Review and comment on all public outreach and technical assistance materials;
- Advise on how to best reach target audiences;
- Review and comment on the public outreach and technical assistance elements of the Rhode Island nonpoint pollution program;
- Develop a strategy which recommends a mechanism to coordinate ongoing and future public outreach and technical assistance efforts and identify a permanent clearinghouse for nonpoint source public materials.

Each technical advisory committee was also tasked to identify public outreach and education needs as they become evident for the Public Outreach and Technical Assistance subcommittee.

Following submittal of the Rhode Island nonpoint program to NOAA and EPA, RIDEM and CRMC will hold one or more public hearings on the update of the Nonpoint Source Management Plan and on all regulation changes developed to implement section 6217 requirements.

Additional public education and outreach efforts conducted by CRMC designed to educate the public about section 6217 include: special issues of *Coastal Features* newsletter which focused on the development of the Rhode Island nonpoint pollution program; a "Pollution is Pointless" poster about nonpoint source issues in the state; the distribution of over 1,000 copies of the section 6217 fact sheets and brochures developed by NOAA and EPA; and a slide show that outlines section 6217 requirements.

Additional outreach and education efforts conducted by RIDEM included: development of the *Rhode Island Community Nonpoint Source Pollution Management Guide* to assist local officials in making informed decisions about the quality of proposed developments and potential nonpoint pollution problems; support for the development and distribution of *The Environmental Guide for Marinas: Controlling Nonpoint Source and Stormwater Pollution in Rhode Island* and *The Community Wastewater Management Guidance Manual*; development and distribution, in cooperation with Save The Bay, of a pumpout facilities chart for Narragansett Bay boaters; and, implementing the Ocean State Cleanup and Recycling program and the Pollution Prevention Program.

g. Administrative Coordination

For program approval, the coastal nonpoint program must include administrative coordination mechanisms. At a minimum, the program must include a list of state, regional and local agencies and the role that they will play in developing and implementing the

program.

This requirement will be environmentally beneficial because it will help avoid conflicts and duplication of effort among the agencies involved in the coastal nonpoint program and ensure that the various agencies are fulfilling their responsibilities to implement the program. In recognizing their specific responsibilities, agencies will be able to refine policies and procedures and maximize limited resources to more effectively support the goals of section 6217.

As discussed in section 4.B.1.a above, the primary mechanisms for implementation of the Rhode Island nonpoint program will be administered through the existing state regulatory agencies, the CRMC and the RIDEM. Supplementary to these mechanisms, the state will rely upon the Municipal Comprehensive Planning Program, state enabling acts related to land use planning, and the State Guide Plan.

The Rhode Island program submission describes the state, regional, and local agencies and programs and their role in developing and implementing the state nonpoint program. Programs under the CRMC include the Municipal Harbor Management Program, Special Area Management Plans, rights-of-way designation program, dock registration program, marina certification program, and permit requirements program. RIDEM programs include permit and dam safety program in the Division of Freshwater Wetlands; the Individual Sewage Disposal System (ISDS), groundwater protection, wellhead protection, and groundwater investigations programs in the Division of Groundwater; and, ISDS, the water quality regulations, water quality certification, Narragansett Bay, wastewater treatment, shellfish growing area monitoring, harbor management water quality assessment, and marina pump-out facilities siting programs in the Division of Water Resources.

Virtually any proposed construction activity within the Rhode Island 6217 management area requires a review by at least one of the above regulatory programs.

h. Monitoring

For program approval, the coastal nonpoint program must contain a description of any necessary monitoring techniques to accompany the management measures to assess over time the success of the measures in reducing pollution loads and improving water quality. The EPA (g) guidance provides guidance for measuring changes in pollution loads and in water quality that may result from the implementation of management measures and for ensuring that the measures are implemented, inspected, and maintained properly.

This requirement should have a beneficial environmental effect because water quality monitoring is the most direct and defensible tool available to evaluate water quality and its response to management measures and other factors. By tracking management measures and water quality simultaneously, states will be able to evaluate the performance of the management measures and determine the need for additional management measures to meet water quality objectives.

As discussed in Section 2.B(6) of this EA, the Rhode Island program submission does not include a monitoring plan. In order to receive final program approval, the State must develop a plan within two years. The Rhode Island program submission does describe numerous existing monitoring programs, including State and federal programs and volunteer monitoring efforts. RIDEM conducts several surface water quality monitoring programs that can be used to measure changes in water quality attributable to reductions in nonpoint source pollution. These programs include performing water quality checks at all State-owned and

operated beaches and conducting biological monitoring at numerous stations on rivers and streams. RIDEM also contracts with the U.S. Geological Survey to conduct riverine trend monitoring on a monthly basis at six stations on the Blackstone, Branch, Pawtuxent, and Pawcatuck Rivers. Ten volunteer programs, including the Salt Pond Watchers Program and the Watershed Watch Program, are also described in the Rhode Island program submission.

i. Enforceable Policies and Mechanisms

For program approval, the coastal nonpoint program must contain enforceable policies and mechanisms to implement the applicable requirements of section 6217, i.e., the (g) measures and additional management measures. The term "enforceable policy" is defined in the CZMA to mean state policies which are legally binding through constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions, by which a state exerts control over private and public land and water uses and natural resources in the coastal zone. Voluntary approaches, including economic incentives, may be used to implement management measures as long as they are backed by enforceable authorities.

This requirement will be environmentally beneficial because states will be able to use a variety of regulatory and/or non-regulatory approaches in order to ensure implementation of the management measures. In addition, the selection and design of enforceable policies can be tailored to specific state or local circumstances. The success of the implementation of the policies can also be enhanced through public education and technical assistance programs.

Rhode Island's coastal nonpoint program is a networked program. Implementation of management measures outside of CRMC's jurisdictional area, but within the 6217 management area, will be administered by the RIDEM.

Management measures for urban runoff will be implemented through the RIDEM's Freshwater Wetlands and ISDS regulations; the CRMC's Rhode Island Coastal Resources Management Program (RICRMP), related Special Area Management Plans, and harbor management requirements; and, where these programs do not apply, supplemented by the Municipal Comprehensive Planning Program, enabling acts related to land use planning, and the State Guide Plan.

Management measures for marinas will be implemented primarily through existing and minor changes to the RICRMP, amendments to the Harbor Management program, and the state's Water Quality regulations.

Management measures for hydromodifications will be implemented through the RIDEM's Freshwater Wetlands regulations and Dam Safety program, the State's Water Quality regulations, and through existing requirements of, and proposed amendments to, the RICRMP.

Management measures for wetlands, riparian areas, and vegetated treatment systems are currently implemented by the CRMC and the RIDEM's Freshwater Wetlands programs.

PROGRAM IMPLEMENTATION

2. SOCIOECONOMIC IMPACTS

There should not be any significant socioeconomic impacts associated with the specific components required to be used in developing and implementing the Rhode Island coastal

nonpoint program. However, some impacts may result from efforts to protect and restore coastal waters.

The designation of critical coastal areas and the implementation of additional management measures may prohibit development and certain land and water uses in some areas. CRMC's 200-foot permit jurisdiction (200 feet inland of a shoreline feature) meets the intent of a critical coastal area designation. All development activities within this area are subject to special controls, such as erosion and sediment control requirements, setbacks, buffers, and stormwater management.

Additional technical assistance may be required by local governments and the public in applying additional management measures. However, because Rhode Island currently has a number of technical assistance programs, no significant additional socioeconomic impacts should result. These technical assistance programs will be used to assist municipalities and the general public with implementation of the additional management measures.

A positive impact will be attained through Rhode Island's existing and planned public participation efforts. These efforts give the public the opportunity to participate in the development of the program and help to improve public acceptance of the program. These efforts should also lead to attitude and behavior changes as people become more aware of the environmentally beneficial goals of the coastal nonpoint program. This will produce an increased public awareness of the potential impacts of their activities on the environment and lead to less pollution and lower socioeconomic costs.

4.C ENVIRONMENTAL / SOCIOECONOMIC IMPACTS OF ALTERNATIVES

a. Approval of Rhode Island Coastal Nonpoint Program

As discussed in the preceding sections, the approval of the Rhode Island coastal nonpoint program would have a beneficial effect on the environment because the program would help to control sources of nonpoint pollution and will result in less pollutants reaching coastal waters. For example, because urban runoff is a major source of nonpoint pollution in Rhode Island, the nonpoint program could help to control runoff from industrial areas of pollutants such as heavy metals, sediment, bacteria, nutrients, and petroleum products that contaminate the upper Narragansett Bay. The program could also control stormwater runoff and seepage from septic systems that contaminate areas such as the Salt Ponds, Narrow River, and Greenwich Bay. The coastal nonpoint program would make existing programs more effective by strengthening the links between Federal and Rhode Island state coastal zone management and water quality programs, thereby improving state and local efforts to manage land use activities that degrade coastal waters and habitats.

The requirement for the program to develop additional management measures, to identify critical coastal areas and coastal waters that are not attaining water quality standards, and to identify the land uses that cause or threaten those coastal waters would have a positive environmental effect by focusing attention on existing or potential problem areas that could degrade coastal waters. Rhode Island's 305(b) Report (RIDEM, 1992), the nonpoint source assessment of surface waters, identifies and contains descriptions of the state's waterbodies that are threatened and impaired by nonpoint source pollution. A number of cooperative efforts (e.g., the Greenwich Bay initiative) are underway to prevent and mitigate nonpoint sources of pollution to these identified areas where nonpoint pollution impacts are known to exist or

threaten water quality. Rhode Island's revised Nonpoint Source Management Plan also contains a priority watersheds selection system that establishes an ongoing process for the coordinated targeting of future watershed management efforts to threatened and impaired waters. Based on these efforts, additional management measures will be developed to address these threatened and impaired waters.

The approval of the Rhode Island coastal nonpoint program would also have positive socioeconomic benefits. The improvements in coastal water quality that would result from controlling nonpoint source pollution would increase the aesthetic value of coastal areas, and would help ensure that beaches and shellfishing areas remain open, thus benefiting tourism and providing opportunities for boating and swimming and other water-related activities.

b. Conditional Approval of Rhode Island Coastal Nonpoint Program

The conditional approval of the Rhode Island coastal nonpoint program will have a beneficial effect on the environment because it will produce the same beneficial results as approval, provided Rhode Island satisfies the conditions, and will, at least temporarily, avoid the adverse impacts of denying approval. The implementation of portions of a conditionally approved program will begin to fulfill the intent of section 6217 by helping to control sources of nonpoint pollution and will result in fewer pollutants reaching coastal waters. The same socioeconomic impacts resulting from changes in land and water uses that are associated with approval of the Rhode Island program should also result from conditional approval.

c. Deny Approval of Rhode Island Coastal Nonpoint Program

The denial of approval of the Rhode Island coastal nonpoint program would result in a reliance on existing programs to control nonpoint source pollution. It would result in the loss of a portion of Federal funds awarded under section 306 of the CZMA and section 319 of the CWA. This may produce adverse environmental impacts because it may cause the state not to implement management measures that are meant to control nonpoint pollution.

Nonpoint pollution has caused significant environmental problems in Rhode Island. Water quality has continued to deteriorate in the poorly flushed estuaries and coastal embayments. For example, according to the water quality assessment in the Rhode Island 305(b) Report (RIDEM, 1992), the majority of estuarine and coastal waters, including salt ponds, fully support designated uses, and are fishable and swimmable. However, nine percent of these coastal waters do not support designated uses. The major impacts on designated uses are due mainly to heavy metals and low dissolved oxygen in the Providence River, low dissolved oxygen in Greenwich Bay and the coves of the Palmer River, and coliform bacteria in the conditional shellfishing areas of Greenwich Bay. Nonpoint pollution from failed septic systems and from stormwater runoff has caused closure of shellfishing areas in Greenwich Bay and the Narrow River. Harvesting of quahogs in the mid and upper portions of Narragansett Bay is closed due to high levels of fecal coliform bacteria. Elevated levels of bacteria have also caused closure of bathing beaches. Twenty-eight percent of the Bay, including Mount Hope Bay, and the Providence River, are permanently closed to shellfishing because of high levels of coliform bacteria.

The denial of approval might also have an adverse economic impact because the continued degradation of water quality will affect the recreational and commercial uses and

users of coastal waters. Denying approval might also cause the state not to implement a second tier of pollution control provided by additional management measures that are meant to restore degraded coastal waters and protect critical coastal areas against future pollution.

4.D UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

The conditional approval of the Rhode Island coastal nonpoint program and the implementation of management measures should not produce any adverse environmental impacts, either avoidable or unavoidable. The Rhode Island coastal nonpoint program is intended to protect the environment by controlling nonpoint pollution and protecting and restoring coastal waters. There may be some changes in the patterns of land and water uses in order to avoid activities that degrade coastal waters and habitats. These changes in activities should not result in any adverse environmental impacts, either avoidable or unavoidable. In addition, section 6217(g) requires a description of any necessary monitoring techniques to accompany the management measures to assess over time the success of the measures in reducing pollution loads and improving water quality. The Rhode Island program addresses these required monitoring techniques in Volume II, chapter 13 of the program submission.

4.E RELATIONSHIP BETWEEN SHORT-TERM USES OF ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The overall purpose of section 6217 and the Rhode Island coastal nonpoint program is to protect and restore coastal waters and thus to enhance the long-term productivity of all coastal resources. The NOAA/EPA review of the Rhode Island program and preparation of this environmental assessment have not indicated that the Rhode Island program includes any short-term uses of the environment that may reduce long-term productivity. Some short-term uses of the environment may have to be modified in response to implementation of management measures. This may result in short-term costs to the users, but will result in long-term benefits to the environment and a corresponding increase in long-term productivity through cleaner coastal waters, protected resources, and increased productivity.

4.F IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NOAA does not anticipate any irreversible or irretrievable commitment of resources as a result of the conditional approval of the Rhode Island coastal nonpoint program. However, the section 6217 requirements for states and territories to establish a 6217 management area, to implement management measures in this area, and to identify and map critical coastal areas that need additional measures to protect them against present and future nonpoint pollution problems, may have the effect of reallocating resources for an indefinite period of time. The identification of critical areas may also have the effect of restricting development or other activities in the critical areas and concentrating these activities in other locations. Although development activity results in the affected site being committed to the new use for an indefinite period of time, and can practically be considered an irretrievable commitment of resources, the amount of resources is expected to be minimal. Also, although critical areas may need special controls such as setbacks and low density zoning to protect coastal waters, these designations may change in the future.

5. LIST OF PREPARERS

Joseph P. Flanagan - Environmental Protection Specialist, Coastal Programs Division in the Office of Ocean and Coastal Resource Management, had lead responsibility for the preparation of the Rhode Island environmental assessment. He has been involved in the preparation of environmental impact statements and assessments since 1980, mainly in NOAA's Ocean Minerals and Energy Division. He has a B.S. in Geology/Chemistry from the University of Miami and an M.S. in Environmental Systems Management from The American University.

6. LIST OF AGENCIES AND PERSONS CONSULTED

The following Federal and Rhode Island agencies were consulted during the preparation of the environmental assessment and during the review of the Rhode Island coastal nonpoint program. These agencies also received a copy of the environmental assessment.

Federal Agencies

Environmental Protection Agency
- Office of Wetlands, Oceans and Watersheds
- Office of Ecosystem Protection
- Region I - Nonpoint Source Coordinator

Department of Commerce
- National Marine Fisheries Service

Department of the Interior
- U.S. Fish and Wildlife Service

Rhode Island Agencies

Coastal Resources Management Council
Department of Environmental Management
Department of Administration

7. FINDING OF NO SIGNIFICANT ENVIRONMENTAL IMPACT

Having reviewed the environmental assessment and the available information relating to the proposed action, I have determined that there will be no significant adverse environmental impact resulting from the action and that preparation of an environmental impact statement on the action is not required by Section 102 (2) (c) of the National Environmental Policy Act or its implementing regulations.

_____ _____

Assistant Administrator for Ocean Services and Coastal Zone Management, NOAA — Date

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